

SHOUT
SHARE **IT**





From Betty -
2 Laura

1912.

A NATURALIST
ON DESERT ISLANDS



SIR FREDERIC TAKES A "TRICK" AT THE WHEEL.

[*Frontispiece.*

4
107
C3498
H4

A NATURALIST

ON DESERT ISLANDS

BY

PERCY R. LOWE, B.A., M.B.(CANTAB)

MEMBER OF THE BRITISH ORNITHOLOGISTS' UNION

WITH THIRTY-TWO PLATES AND THREE MAPS



WITHERBY & CO.

326 HIGH HOLBORN LONDON

1911

TO

LAURA, COUNTESS OF WILTON

IN APPRECIATION OF HER WONDERFUL POWERS OF
OBSERVATION AND INTENSE SYMPATHY WITH WILD NATURE,
THIS BOOK IS DEDICATED.

INTRODUCTORY.

ALTHOUGH we were always travelling, this is no "Book of Travels." No "useful information" will be found in it about the places we went to. In truth, as far as most of them were concerned, there is none to find. Therein lay one of their great charms. Sometimes a scrap of history has crept into our "reflections," derived from the desultory doings of early discoverers, buccaneers, and sea-rovers; but by the simple lapse of time and the glamour of adventure this history is no longer history—it has become romance. But there will be little enough even of this, for this book deals with "Desert Islands" for the sake of what they are in themselves, and for the sake of what they contain of beast and bird, of rocks and land-flowers, of sea-flowers and coral-gardens.

For six consecutive winters it was my good fortune to accompany Sir Frederic Johnstone and his wife Lady Wilton during some delightful yachting cruises in the Caribbean Sea and the Gulf of Mexico. During these

six cruises we visited almost every island, large or small, in these two basins, besides seeing something of places on the neighbouring coasts of the mainland—Venezuela, Mexico, and Florida.

Many of these islands are far off the beaten track, seldom or never visited, and practically unknown even to those who are quite familiar with the West Indies as generally understood.

Commercially and politically speaking they are to all intents and purposes non-existent. They have little or no historical, and very little human, interest. To appreciate them at all one must be a naturalist in the widest sense of the term.

To those who have the wandering spirit, who delight in seeing Nature, pure and unalloyed, who feel the strong desire now and again to get away from the babble and clamour of their fellow creatures, these islands have the attraction that all isolated islands inevitably possess. For anyone else, it may be frankly said they would probably prove to be intensely boring.

Some of them are uninhabited ; others are inhabited by a single family who have elected to make a home on them and there to live the “ simple life ” ; others are inhabited by fishermen, at certain times of the year only ; while others, such as the Caymans, give shelter to small

communities, descended for the most part from shipwrecked sailors, who live as isolated and uneventful an existence as one could voluntarily wish to do.

It was then to these last several classes of derelict islands, and to some unfrequented and out of the way spots on the fringes of the mainland, that after "doing" the usual round we soon began to turn our attention.

It is one of the charms of yachting that one can wander far off the beaten highway, throw aside all the tiresome conventions of modern life, and yet while not "roughing" it in the very least, be brought, as it were, to the very feet of Nature. To those who are unable to appreciate the charms of "camping-out" this may sound highly attractive; but it has this disadvantage for the writer, that everything proceeds so smoothly that there are none of the hundred and one little incidents and contretemps which constantly crop up under such circumstances to lend a note of adventure to his account.

It will be found therefore, that although we visited more than one island which might well have done duty for another Robinson Crusoe—yet alas! we had no such adventures, suffered no shipwrecks, experienced no struggles with savage inhabitants, no desperate straits, nothing in fact which one might reasonably have expected or secretly hoped for.

Their charm lay rather in their complete privacy and inaccessibility ; in the sense of “ exploration ” that one experienced while on them ; in the feeling that they belonged to no one but the birds and animals upon them ; that as far as anyone else was concerned, one could go on them *where* one liked, *when* one liked, and *how* one liked. One felt constantly inclined to thank God that they were so commercially insignificant and generally worthless that man had not swooped down to “ improve ” them out of all recognition.

One of them at least is a little playground where grown-up people could go “ bird-nesting ” and feel young again ; where one could play at “ desert islands ” among the coral reefs, lagoons and shady groves of cocoa-nut, thatch palms, and satin-wood trees ; where one could fish or bathe the whole day long ; where one could forget the hurly-burly, the worries and petty jealousies of the world, and be thankful that there was still left at least one little Eden where one could be happy with simple things.

P. R. L.

STAMFORD,

September, 1911.

CONTENTS.

PART I.—SWAN ISLAND.

CHAPTER I.	PAGE
WESTWARD HO ! - - - - -	3
CHAPTER II.	
LIFE ON A CORAL ISLAND - - - - -	12
CHAPTER III.	
A TALK ABOUT BUCCANEERS - - - - -	24
CHAPTER IV.	
ON THE SUBJECT OF TURTLES - - - - -	31
CHAPTER V.	
BIRDS AND SOME BIRD-PROBLEMS - - - - -	38
CHAPTER VI.	
CORALS AND CORAL REEFS - - - - -	55
CHAPTER VII.	
FISHING AND SPORTING FISH - - - - -	69
CHAPTER VIII.	
“ A YOUNG AND RISING ” ISLAND - - - - -	83
CHAPTER IX.	
HOW THE LAND PLANTS CAME TO SWAN ISLAND -	90

CONTENTS.

CHAPTER X.		PAGE
LITTLE SWAN ISLAND - - - - -		105
CHAPTER XI.		
HERMIT CRABS - - - - -		118
CHAPTER XII.		
WHAT SWAN ISLAND REALLY IS - - - - -		128
PART II.—BLANQUILLA ISLAND.		
CHAPTER I.		
A LONELY "DESERT ISLAND" AND A HERMIT -		145
CHAPTER II.		
BIRDS - - - - -		157
CHAPTER III.		
WE ARE SUSPECTED OF GUN-RUNNING - - -		170
CHAPTER IV.		
SOME FEATURES OF BLANQUILLA—ANIMAL, VEGETABLE AND GEOLOGICAL - - - - -		177
PART III.—THE HERMANOS ISLANDS.		
CHAPTER I.		
HIDDEN TREASURE - - - - -		189
CHAPTER II.		
A DIFFICULT LANDING - - - - -		197
CHAPTER III.		
BIRDS - - - - -		204

LIST OF ILLUSTRATIONS.

PART I.

FACING
PAGE

SIR FREDERIC TAKES A "TRICK" AT THE WHEEL— <i>Frontispiece</i> .	
STEAM YACHT "ZENAIIDA," R.Y.S., 850 TONS, AT GRENADA, B.W.I. - - - - -	5
"EASY ALL." "TWO BELLS." - - - - -	6
THE POINT—PALMS AND CORAL. - - - - -	13
"THE LONG SEAWARD MARGIN OF THE PLANTATION." - - -	16
A BIT OF THE HOME PADDOCK WITH COWSHED AND WOODS IN BACKGROUND - - - - -	24
A LIVE LOGGERHEAD TURTLE ON BOARD THE YACHT - - -	34
A CORNER OF THE YACHT DEVOTED TO ORNITHOLOGY - - -	44
A MORNING'S CATCH WITH ROD AND LINE BY LADY WILTON -	67
A HEART-STRAINING JEW-FISH OR SEA-PERCH (NOTE THE FISH TAKEN AS BAIT)	69
LADY WILTON WITH THE SMALLER OF HER TWO QUEEN-FISH -	70
SHARK REFERRED TO IN TEXT: NO. 1, ON BEACH. NO. 2, BEING HAULED ON BOARD THE YACHT - - - - -	75
AUTHOR AND TARPON (119 LBS.) - - - - -	76
THE DEVIL-FISH CAUGHT AT SWAN ISLAND - - - - -	78
THE HERON POND - - - - -	97
LITTLE SWAN ISLAND—DESCENDING THE CLIFF TO OUR LANDING PLACE - - - - -	106
FRIGATE-BIRDS AND THEIR NESTS - - - - -	109
IGUANA, ABOUT FIVE FEET LONG—LITTLE SWAN ISLAND - -	115
LITTLE SWAN ISLAND—BOOBY (<i>S. sula</i>) AND YOUNG IN NEST -	116

	PART II.	FACING PAGE
WEATHER-WORN GRANITE—BLANQUILLA	- - - -	148
THE HERMIT'S HUT	- - - -	152
BLANQUILLA—A CURIOSLY ROUNDED BLOCK OF GRANITE	-	155
A COLLECTING PARTY ON BLANQUILLA	- - - -	162
BLANQUILLA—WEATHERED GRANITE—EFFECTS OF TRADE-WIND ACTION	- - - -	170
GRANITE CLIFF WITH OVERLYING CORAL—BLANQUILLA—SOUTH COAST	- - - -	183

PART III.

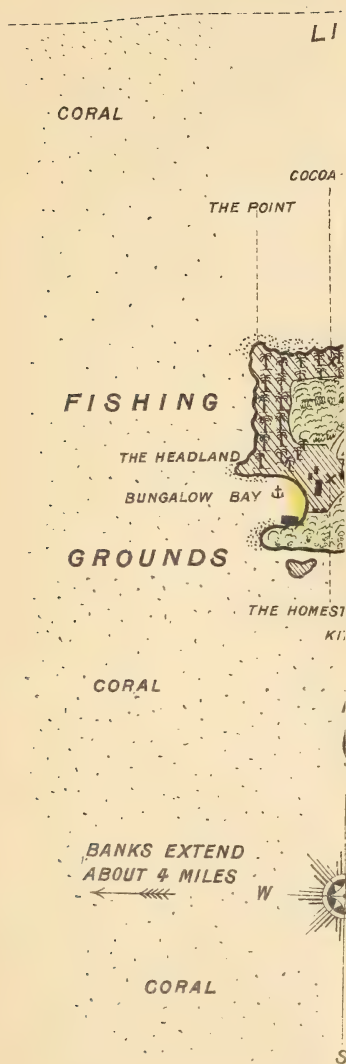
LANDING PARTY ON THE TOP OF ORQUILLA	- - - -	198
ORQUILLA—ROUGH GOING—PARTY FORCING A WAY THROUGH CACTUS FOREST—NEAR THE SUMMIT	- - - -	204
THE BLUE-FACED GANNET (<i>S. cyanops</i>) ON NEST	- - -	207
LOS HERMANOS ISLETS — FRIGATE-BIRD ON NEST — COMPARE SITUATION WITH SITE SELECTED IN SWAN ISLAND	- -	211
FRIGATE-BIRD ON NEST (OLD COCK)—LOS HERMANOS ISLANDS	-	212
OLD FEMALE FRIGATE-BIRD ON NEST	- - - -	214
NEWLY HATCHED NAKED SQUAB OF FRIGATE-BIRD	- - -	214
THE TOP OF ORQUILLA—CUTTING A WAY THROUGH THE CACTUS	-	220

PART I.—SWAN ISLAND.

A MODERN "SWISS FAMILY ROBINSON" ISLAND.

"I have found the haven; hope and fortune, adieu!
You have played with me long enough;
Now amuse yourself with others."

DEEP SE



Green = Original Woods.

Yellow = Sandy Beaches.

~~Wavy lines~~ = Coral Reefs.

DEEP SI

CHAPTER I.

WESTWARD HO !

IN WHICH THE READER IS INTRODUCED TO AN ALMOST UNKNOWN
CORAL ISLAND.

FAR away, in the western end of the Caribbean Sea, miles out of the track pursued by the ordinary visitor to the West Indies, and ninety-eight almost due north of Patook Cape (the nearest point of land in Honduras), lie two mere specks of coral, known as "Swan Islands."

They seem to be anchored like floating gardens on the placid surface of a sapphire sea—lonely and isolated, and unknown. So practically unknown, indeed, that the staff of the Royal Geographical Society had never heard of them, and could give me no information concerning them, beyond what I had already read in the "West India Pilot." To be exact, they are situated in lat. $17^{\circ} 25' N.$, long. $83^{\circ} 56' W.$ If you look for them on the map, it is just possible you will look in vain; for in some maps they are either not indicated at all, or, if they are, they are merely pricked in as two small dots which are sometimes nameless.

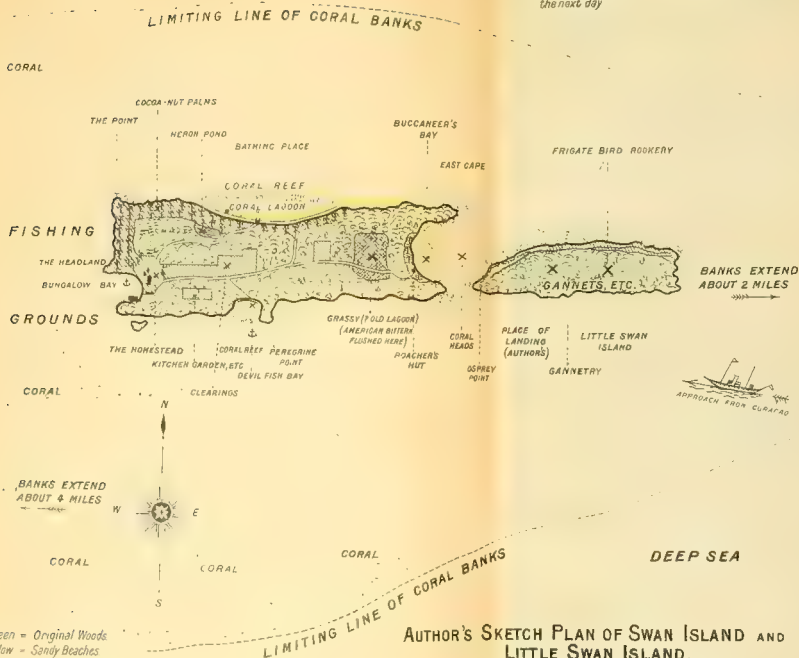
These twin islands, of coral limestone and coral debris, are densely overgrown with forest trees and bright green scrub, and are separated by a space of very shallow water, barely four hundred yards in width, at the bottom of which, living reef-building corals are in process of rapidly effecting a dry-land connection between the two islands.

In calm weather it is just possible to pick one's way through this gap in a boat; but there are always swirling

DEEP SEA

DEEP SEA

NOTE:- The Tides around **THE ISLANDS** are most peculiar, flowing on one day at a given hour in quite a different direction to that of the next day



Green = Original Woods
Yellow = Sandy Beaches
Blue = Coral Reefs

AUTHOR'S SKETCH PLAN OF SWAN ISLAND AND LITTLE SWAN ISLAND.

Scale:- $1\frac{1}{2}$ Inches to about One Mile.

4 A NATURALIST ON DESERT ISLANDS.

eddies and currents, besides a gentle heave of the sea, which leaves exposed for a second or two, the smooth rounded heads of greenish-yellow *Porites*, glistening and slippery looking, or the branching antler-like growths of chocolate-coloured *Madrepores*—both very nasty forms of coral, we might say in passing, to run the nose or the side of a boat against. When the sea is rough, this gap becomes the scene of a whirling maze of creamy-white surf, flying spindrift or crashing breakers. How long it will be before the breakers have pounded and piled up sufficient coral blocks, coral sand, and other debris, to bridge the gap completely, it is difficult to say; but there is good evidence, as we shall see later, to prove that the buccaneers used to anchor their vessels hard by, where now there is only some six feet of water or less.

Anticipating, then, the all important efforts of the breakers and the lowly, unconscious work of the corals, we may speak of these two densely-wooded islets as one, and say that they occupy a length of from three-and-a-half to four miles in an east and west direction, and rest on a submarine bank which is roughly ten miles long by three or four miles wide. The depth of water over this submerged coral bank varies between five and thirteen fathoms, and no words could exaggerate its clearness, which allows one to look down into depths of say sixty or seventy feet, and observe with incredible ease the fascinating wonderland below.

As soon as one has passed the limits of this sunlit bank, with its prodigious quantity of submarine life of every kind and description, the depth of water rapidly increases until, on the north side especially, it sinks down to appalling depths of darkest night. These abysses to the north eventually culminate (and within a very few miles distance) in that stupendous trough across the bottom of this part of the Caribbean Sea known as "Bartlett's Deep"; and so awful and so great is the contrast between the conditions of life obtaining in these depths, as compared with the sunny and seemingly



STEAM YACHT "ZENADA," R.Y.S., 850 TONS, AT GRENADA, B.W.I.

[To face page 5.]

joyous nature of it both upon and around our two little islands, that we shall endeavour in another chapter to picture for the reader some of its awesome realities.

Such then, in brief, were the islands which on one Sunday in the early part of 1908, we were rapidly nearing in the steam yacht "Zenaïda," a boat of some 850 tons belonging to Sir Frederic Johnstone. For all we knew about them then, they might or might not be worth a visit. We knew they contained a few birds—one or two of them supposed to be peculiar to the island and found nowhere else—we knew also that they must be nearly, if not quite, uninhabited, and that they consisted of a mere "scrap of dirt," as a sailor would have it, a hundred miles from any land. But what more could an amateur ornithologist want, a "bird-nesting" expedition to a tropical, and possibly uninhabited island, miles from anywhere? Think of it! you who, perhaps, deem yourself lucky to get a day's leave to explore some well-preserved wood, marsh, or moor at home!

We had left the island of Curaçao (Dutch West Indies, off the coast of Venezuela) at three o'clock on the afternoon of the 15th of January, 1908; and for four days, with the exception of an eight hours' stay over the Rosalind banks, where we had stopped to drift and fish, we had been steaming through the Caribbean Sea in a dead straight line, nine hundred and forty-two miles in length, bound for these two little isolated specks of coral.

Above this vast fluid surface we had seen not a speck of land, and, if we except the flying-fish, barely a sign of life. Sometimes we passed a patch of gulf-weed; sometimes a patch of swarming *globigerinæ*, looking like reddish scum upon the surface of the water; sometimes a tropic-bird would glitter for a minute or two against the blue sky, like a white butterfly, and then would disappear. Otherwise there was nothing very obvious but a lonely, sunlit waste of waters, bounded on the far horizon by fleecy banks of Trade-wind clouds.

There were, as a matter of fact, a thousand things upon the surface, whose existence is undreamt of by the average mortal, who passes on his all-sufficient way quite happy in his ignorance—a swarming world of the most unexpected and surprising forms of life; but to have seen them, or at any rate the greater part of them, we should have required a tow-net and a microscope, to say nothing of some degree of tact in getting the captain to slow down and so lose time.

And now it was the fourth day: it had just struck two bells (1 o'clock), and some of us were on the point of leaving the bridge to go down to lunch, when one of the officers put down his glasses and quietly gave utterance to the remark that he could see Swan Island. And there sure enough it was, right ahead of us, miles away upon the horizon, a hazy, phantom-like streak of blue, with an apparent size of about two feet long by three inches high. Our jibboom was making a dead set, straight for it; now towering high up in the sky yards above it; now curtsying deep down beneath it, or swinging off a point or two to either side; but always coming back gradually or quickly, surely or with a little quivering hesitation, to dwell for a moment point blank upon it.

Surely the little human animals who populate this planet, have done many wonderful things since they first began to exercise the thinking cells of their brains by chipping flints to enable them to live by hunting; and they have mastered many great things which it was essential for them to know; but this trick of navigation, this juggling with the compass and magnetism, with the height of the sun at twelve o'clock and with imaginary lines of latitude and longitude, this wonderful power, in a word, of finding their way with almost unerring certainty over the trackless seas, from one small point to another, thousands of miles apart, seems, with the necessary knowledge which underlies it all, to have been one of the most wonderful tricks which they have made their own. To the man who



“ EASY ALL.” “ TWO BELLS.”

[To face page 6.]

never travels, especially off the beaten track, these may be platitudes, but to those who have just made a successful land-fall, the thought we have endeavoured to express must ever recur again and again, with a constant freshness and reality.

When we came on deck again after lunch, Swan Island looked like a long spinney, standing half submerged in the middle of a vast flooded plain. The trees seemed to be growing in the sea. A little later, and we had "raised the land," low as it turned out to be, and the island in its entirety was a visible fact. Coasting along its southern shore, we could now see the twin nature of what we had at first supposed to be one single island. Both islands were densely wooded; but while the eastern one had low precipitous cliffs, against which the waves dashed and broke into sheets of white spray, the western isle was long and rather flat; sandy beaches, backed by overhanging trees, gleamed here and there along its shores; there was a streak of white surf, where the swell surged gently over a miniature barrier-reef; frigate-birds, with stiffly-extended wings, "planed" in graceful curves high above the green dome of the woods, like skaters for ever on the outside edge.

Such, then, was our first near view of these little islands. Only once before had any naturalist visited them. This was in 1886, when Mr. Chas. Townsend, an American ornithologist, paid a visit to the islands.

It was not likely, therefore, that on such a small island there would be anything left for us to discover, but as the pursuit of health, rather than bird-collecting, was the primary object of Sir Frederic's visit, this was a minor consideration. Originally it had been Sir Frederic's intention to stay only two or three days, but as events turned out, the islands proved so attractive in other ways, and so completely health-restoring, that our stay was prolonged into one of nearly three weeks, and even then it was only the ever-present question of coal-supply that finally dragged us away.

By three o'clock we had reached the western end of the islands, and Captain Lebbern had begun to cast about for a likely-looking approach over the coral banks to the only anchorage which is mentioned in the "West India Pilot." This anchorage is situated at the extreme end of the island, in an ideal little bay, such as one has always associated with the coral islands of one's boyhood, and where, as we were soon to discover, lived the only dwellers on the island. It is graven in indelible lines upon our memory—a rocky headland overgrown with cocoanut palms; a sickle-shaped beach of gleaming white sand; a rustic jetty pushed out through the foaming send of the swell into the gin-clear water, where ever and anon big shoals of fry glitter and flash in the sun; a weather-worn bungalow, lichen-stained and grey, set a little back in the open clearing at the head of the bay, where countless goings to and fro have beaten down the coarse herbage and produced a short crisp turf; a tall flag-staff, a little to the right of the bungalow; a mango tree or two spreading their welcome shade on the green, almost English-looking, turf; and then, for a background, a dense wall of forest-trees which mark the limits of the homestead.

But how to reach it was the question; for the wide-flung coral banks might be studded with half-a-dozen hidden danger-spots lurking beneath the smooth water, and Swan Island so far has not been deemed important enough to be charted. The approach over these coral banks is, in fact, just a little sensational, for the water is not only so absolutely clear that every rock and every patch of weed or waving sea-fans can be seen with almost painful distinctness down below, but the clearness of it gives one the impression that it is nothing like so deep as it really is. It was rather like passing over a chess-board, the black squares being represented by ugly-looking patches of coral rock, the white by patches of gleaming sand; which varied as we got nearer and nearer to the island from a greenish-blue colour to that of a pale

yellow or white. Far in front of us, and as far as we could see on either hand, stretched this chequered board—a sort of mariner's nightmare.

The yacht had been slowed down to a mere crawl; but unconsciously we held our breath as here and there a great black mass loomed up ahead and seemed to be growing half way up to the surface. Time after time, so transparent was the water that it looked any odds that we must strike one of these forbidding masses, when, as a matter of fact, they were many feet below our keel.

Less than a mile from the anchorage, a small boat manned by two negroes and a white man was seen to be coming out to meet us. The white man turned out to be an American, and a son of the owner of the island, which for the first time we discovered to be private property. Mr. A. was good enough to explain that we were a little too far to the eastward of our proper course, which he knew by heart.

Might he offer to pilot us in?

Well, yes, thought our Captain, he rather might; and in a trice Mr. A. had scrambled nimbly up the side of the yacht and up to the bridge, where, with a confidence born of several years' experience of every "stick and stone" on the bottom, he gave his orders to the man at the wheel and directed the pace of the yacht to be increased.

All the way in, and long after our anchor had dropped with a sullen plunge to the sandy bottom of the little bay, Mr. A. entertained us with an account of how he, his father, mother, and a brother, were the only residents (negro servants excepted) on the island, and of the sort of "Swiss Family Robinson" life they led there, turning their hands to almost any sort of job imaginable, from healing fever-stricken castaways, who were once wrecked upon the island, to building a house, milking a cow, making a boat or a landing stage, or growing cocoa-nuts, sugar-cane, tobacco or other crops. Also of how the United States had now annexed the island (a thing which

was news to us), and of how his father owned it, and was, in fact, accredited lord of all he surveyed.

It appeared that the "laird" was originally a sea captain, and had drifted here in the service of a guano or phosphate company. For them he worked for several years, and finally, when the discovery of phosphates in Florida killed the enterprise, he bought the island for a "song," and settled down to spend the rest of his days in the peaceful occupation of growing cocoanuts. He had found his haven, and wished to say good-bye to the world with all its fuss and pothers. "Farewell to fame and fortune! I have played with you long enough, now go and amuse yourself with others," was the old man's motto, and no bad one either, provided you have a little island-de-luxe like this one, that you can call your very own, and are not too particular about the distance of your nearest neighbours.

Many other things we learnt from Mr. A., who, in the intervals of trying to swallow tea, good-naturedly did his best to answer the dozens of questions with which we plied him; of the fish they caught for food (two negroes being pretty constantly employed for the purpose), and of the giant fish they caught for sport (of which more anon); of the crops, fruit, and vegetables they grew; of the turtles which annually came to lay their eggs on the sandy beaches; of the huge devil-fish they sometimes saw, and the monster shark—an ocean-going tramp—which gave them an occasional look up. Then he had much to say of the wonders of their coral gardens, a little about the birds, and something of a wonderful race of giant rats which lived upon the eastern island. This island was uninhabited, and they hardly ever went there; a sort of asylum it was for birds and beasts, which lived as undisturbed as if there were no human beings to harry them in all the world.

Really it all seemed wonderfully in keeping with one's preconceived notions of "desert islands," or had we indeed

arrived by chance at some little garden of the Hesperides in the land of the Hyperboreans, far away in the west, on the ultimate margin of the sea? We try not to exaggerate, but had you, good reader, ever tasted some of the delicious fruit with which the branches of the lime trees on this island fairly groaned, or seen these same trees one golden blaze of colour against the green background of the little forest clearings in which the islanders had made their gardens, you might have thought, in very truth, that there was still left in this twentieth century one last unknown retreat upon the ocean, where Hera still guarded her golden apples.

If so, it did not detract from our interest in it all to learn that the "Zenaïda" was the first yacht which had ever invaded her sanctuary.

That night a soft breeze came in from the south-west, bringing with it a gentle, heaving swell which made the yacht roll a little. Had we needed any further aid to sleep than this rocking of our ocean-going cradle (perhaps some would have been happier without it), the soft soughing of the wind as it stirred the palm fronds along the rock-strewn headland and the drowsy splash and thud of waves upon a sandy beach would have done the trick. As we took a last turn upon the deck that night, the moon was throwing a glittering path of molten silver far out across the sea towards distant Yucatan. Its pale ghostly light fell full upon the cocoanut palms, making every stem and every graceful frond stand out in sharp relief against the sky. At the top end of the bay a solitary light was twinkling against a dark mass of trees, and we concluded that our arrival had given the islanders enough excuse for discussion to keep them up long past their usual hour for going to bed.

CHAPTER II.

LIFE ON A CORAL ISLAND.

To me it has always seemed rather remarkable how almost everyone is more or less interested in small islands, especially if they are far enough away and only scantily populated. If only one man or one family lives on them the interest in them seems to be even greater still. It appears strange that we should be so naturally attracted to the idea ; because life must necessarily proceed, under such circumstances, with the least possible amount of incident and change ; and if the truth must be told, we should most of us be extremely bored after a few months of such isolation.

Yet, although there was, in the ordinary way of speaking, really very little "to do" on Swan Island, the three weeks we were there, passed like a flash—perhaps one might almost say like a pleasant dream.

In a little community of this kind, so far away from the ordinary distractions of the restless world, the most prosaic subjects and occupations seem to have an exaggerated interest. The enlargement of the jetty, for instance, was an event. Its daily progress and the little problems in connection with its structure seemed matters of absorbing interest. One day a ship called with some cement to be used in its construction. Its arrival had been for long anxiously awaited. *Now*, at last ! the great work could be proceeded with. Everyone lent a hand in hauling up the sacks from the landing-place. If it had been our own jetty we could not have felt a keener



THE POINT—PALMS AND CORAL.

[To face page 13.]

interest in this bit of amateur work. We wanted to help. There seemed to be nothing more fascinating than making jetties and getting thoroughly messed up with cement—on a coral island. The sudden news of this ship's arrival, brought by one of the "boys," who came running from the Point; the picture we got of her as she came into view from behind the palm-grown headland and sounded her siren; and still more, when, after less than an hour's stay, she gave a farewell blast and sailed away again to disappear beneath the far horizon, seemed events quite out of the ordinary run of one's experiences. It made us feel how lonely these people must have been at times. We almost knew now how it felt to be marooned.

One day, again, the donkey, which was given to irrelevant fits of fury, suddenly "saw red," rushed at an inoffensive calf, and before anyone could interfere had "savaged" it to death. When you have only one calf on an isolated island, and that calf is the special care and pet of the lady superior, this is an event of the first magnitude. No cold-blooded murder in some big city could have caused a greater shock to the even tenour of this peaceful little world; and when, after a solemn court-martial at which the death sentence was passed, the donkey was, then and there, led forth, to expiate his crime—not by any means the first, as we learnt—we felt almost as if a shadow had momentarily darkened the fair semblance of this island paradise. On another occasion, when some iguanas made a raid on the kitchen garden and ate up all Madame's carefully cherished salads, the enormity of the offence assumed the proportions of a general railway strike.

One took an exaggerated interest, indeed, in almost everything on the island; for everything seemed to have an altogether different value from what it would elsewhere. One even viewed the pigs from a different standpoint, especially when one noticed that their styres were small natural caverns in the coral limestone, and that gaily flowering morning-glories hung in festoons around the confines of their yard.

As a rule one does not interest oneself in the domestic ordinances of a strange household, but here everything was different. One could not help feeling curious and interested in every small detail. How did these people manage? What did they live on? How did they amuse themselves during leisure hours? Suppose Caffiana, who seemed to be all smiles and giggles, and whose curly wisp-like hair was so shiny and so redolent of cocoanut oil, were suddenly to get the sulks, refuse to cook any longer, pack up her trunk (or whatever took its place) and give notice on the spot? These domestic tragedies are common enough and bad enough when you are within hail of a registry office, but out here the problem of "getting suited" again is simply appalling.

Caffiana naturally reminds us of Adolphus. One might have thought that on a tiny coral island like this, where one of the great charms lies in being able to order one's dress in strict accordance with the necessities of the case, many of the conventions of everyday life would have been gradually dropped. But habit or convention is a strange, unreasoning master; and we were not a little astonished to notice that on every Sunday each negro gentleman appeared dressed in such garments as he considered to be the very last word in the fashions. In this respect Adolphus represented the ultimate limit. No one could touch him. His tie rivalled the hibiscus shrubs in the glory of its green and scarlet. His waistcoat simply clashed with the sober and more graduated tints of the surrounding vegetation. His trousers were the colour of the cloudless sky; while as one last finishing touch to so much splendour, he walked abroad amid all the natural beauty of these virgin woods in a pair of glistening patent-leather boots with buttons. When we first saw Adolphus in all this glory, he was very self-conscious. He gave us a sort of sickly, diffident smile. It was as much as to say: "You see me in all this splendour—do not take it to heart; perhaps some day your turn will come too." As at the time we had very little on of a super-

fluous nature, and were engaged in the somewhat trying occupation of collecting spiders, we felt considerably out of it.

However, I daresay we misjudged poor Adolphus ; possibly Caffiana was at the bottom of the whole business. We rather think so, because whenever Adolphus came under the range of vision of this susceptible lady, Caffiana tossed her head high, gave a superbly disdainful glance at the patent-leather shoes, and subsided into throaty giggles and highly nervous laughter. And these signs I took to be symptomatic of the dawn of a romance. On any other day than Sunday, Adolphus was far more approachable. Sometimes we would come across him and the other " boys " in the cocoanut plantations, when, tired perhaps with tramping the woods in search of birds, we would fling ourselves down and watch them husking the nuts.

How many times since have we pictured such truly tropical scenes and longed to see them again ! The green gloom beneath the feathery canopy of palm fronds is pierced with a hundred stabbing shafts of glinting sunlight ; a small space, where a tree or two had fallen beneath the stroke of a storm, is ablaze with sunshine and genial warmth, in contrast with the deep shade elsewhere, where guinea-grass of the deepest green grows knee-high ; the little gang of workers keep up a continuous jabber, interspersed with bursts of high falsetto laughter. One hears a constant rip and tearing as the smooth, green coverings of the nuts are deftly prized open, and the thick inner lining of rich brown fibre is exposed ; the piles of nuts grow larger and larger as we sit lazily by and watch. They are sorted into heaps, according to their size, by being passed through iron rings which project from stakes stuck upright in the ground. Another heap is formed of the empty husks, while a little way off is still another one composed of the rotting relics of a previous gathering. In this heap an English fox-terrier is hard at work, frantically scraping and burrowing for an imaginary rat.

From where we sit smoking, with our back against the stone-like trunk of a palm, we can see the long seaward margin of the plantation, and note its grandly beautiful, sweeping curve, as it faithfully follows the very verge of the land ; a sight which to our mind is one of the most beautiful things in nature.

The sea has piled up the sand of the beach into a long gentle slope, the top of which only stops abruptly at the very foot of the over-arching trees. Just where the dainty, lace-like fringe of the thinly spread surf, reaches its ultimate limit on the sand, is a long wavy line of feathery, sun-bleached jetsam—the dead remains of delicate sea-weeds, various kinds of sponges, tufts of encrusted Millipores and the pale mauve of fan-shaped Gorgonias. Farther away, where the beach loses the protection of the reef, great sheets of creamy surf go sweeping up the broad slopes of sand, advancing and receding in irregular sequences, far as the eye can follow them, and forming momentary patches of gleaming white upon the golden carpet. Beyond the reef, the eye ranges outwards over the glittering sea, till it reaches the line of the big white Trade clouds which sit upon its very edge.

Husking cocoanuts is not nearly so nice as sitting by like this and seeing it done. It is a wearisome task, but a good man will husk fifteen hundred in a day. When up to a certain standard size they will fetch four pounds a thousand. The "laird" told me he had four thousand five hundred trees in full bearing, with three thousand young ones coming on, and plenty of room to plant more. When you come to think of it, it is an astounding thing what an incredible number of cocoanuts are used up yearly for the world's wants. From the two small islands of Cayman Brac and Little Cayman, which lie about two hundred miles to the north of this island, and which are each about nine miles long by one-and-a-half miles broad, two million nuts are annually exported.



“ THE LONG SEAWARD MARGIN OF THE PLANTATION.”

[*To face page 16.*

With these figures to go on, imagine the innumerable numbers of tropical islands in the world where cocoanuts flourish, and the hundreds of miles of suitable seashore along which the trees grow upon the various continents, and then try and figure out the mighty sum total of the world's production of nuts. Where do they all go to ? Of course, if you think, as we did, that the only use for cocoanuts is to provide a very laudable object for small boys to shy at and afterwards test the digestive powers of their stomachs on, or, may be, for the making of an occasional cocoanut ice-cream, or the flavouring of a cake or pudding, you will think there must be an awful waste going on in the world, every year, of a thing which really is not wanted and which we have not asked for. Even now, we more than half suspect, the great majority of people are ignorant of the fact that the "flesh," or eatable part of the cocoanut, is sun-dried to the tune of thousands of tons yearly (being in this state known to commerce as copra), and is used for the manufacture of cocoanut oil.

I should imagine there is no more demoralising tree in the world than the cocoanut palm. It is just the sort of thing some of our "unemployables" are looking for. You have only got to summon up enough energy to plant a sufficient number of young ones, and time does the rest for you. All it asks of you is to wait for some seven years, until the tree has had time to become full grown, producing an average of some hundred nuts a year (sometimes less, sometimes a great deal more), not all at once, which might be inconvenient, but spread over four or five harvests annually. And this it considerably goes on doing for sixty, seventy, or eighty years, and you need never lift a finger to help it. The tree, in fact, simply encourages you to be lazy, and if you have any grit left in you after living in its company for any length of time, the soft "lotus-eating" kind of climate in which it flourishes will soon take it out of you.

The South Sea Islanders never had a chance with a tree like this. Why work or worry or fuss around when

a few of these trees will provide you with every possible thing you can require—with fibre to make mats with ; shell to burn as fuel or to use as water-vessels, cups or ladles ; with leaves to use as thatch for your house or as mats, screens and baskets ; when the wood of the trunk or the mid-rib of the leaf (fifteen to sixteen feet long) can be used in making the walls of your dwelling ; when you can make rope out of the fibrous tissue of the young stem, or walking sticks out of the central parts of the mature tree ; when you can get enough oil to swim in from the flesh of the nut itself, and soap from the oil mixed with the ash derived from the burnt husks ; when you can have at your command an alcoholic drink made from the juice of the wounded spathe, or a vinegar from this when it has turned sour ; when you can make a salad of the central shoot when quite young, or at times an agreeable pickle ; when, besides eating the nut in its ripe state, you can eat it in its young and tender unripe state, or in its over-ripe state when it has begun to sprout, and to fill the whole of the interior of the shell with a very eatable sponge-like mass ; when you can drink its so-called milk (which God forbid) ; and when in a word you can make it do almost anything but talk ?

We have often wondered how it came about that since the days of the buccaneers such a “tight” little island as Swan Island should have been left in lonely solitude, absolutely untroubled and ignored by man until quite recent times. For, after all, here was seven hundred acres or so of good, fertile and well-timbered land, which would grow anything for the asking—a little sea-girt property with no fences to keep up, no land-taxes to pay, no title-deeds to bother over, and with a climate which is almost perfect, all going begging, simply waiting for the first man to come along and set his foot upon it, stick up his national flag and say, “This is my land.”

Swan Island has no written history ; but as far as I have been able to discover, the first men who ever laid a claim to it since the days of the buccaneers were English-

men. From information which I have received from the Grand Cayman Island, it appears that in the early forties of the last century, two men, of the names of Alley and Page, went from that island, where they were resident, and landed on Swan Island. “They took possession of the island, and felled sufficient hard-wood timber to make the skeleton of a schooner.” With this timber they went back to the Grand Cayman, and built a small vessel which they called the “Champion.” Strangely enough, although it pleased them to call the island “their property,” Alley and Page do not appear ever to have returned to their newly acquired kingdom, and eventually, after living long enough to see their vessel go down at her moorings in the Great Sound, at Grand Caymen, during the hurricane of 1876, Page took his leave of this world, some thirty years later than his partner Alley.

In the “fifties,” one Samuel Parsons, grandfather of a present native of the Grand Cayman, was the next candidate to try his hand at annexation. The tale goes that he also “took possession” of the island, and “placed thereon a number of goats, which bred, and in a few years formed a very large herd.” Although from the point of view of the student of plant dispersal, this was an abominable crime,* yet it was a distinct advance on the methods pursued by Alley and Page. But even Samuel Parsons does not appear to have gone far enough in establishing his claim; for thinking his goats and his island safe, or very likely not thinking any more about them at all till too late, he found when next he turned up, after the lapse of years, yet another claimant happily established there.

This was Mr. A., the man in present possession, who appears to have acted on the principle of “J’y suis, j’y reste.” “He had found his haven,” and having done so he proceeded, without more ado, gradually to eat up all Mr. Parsons’ goats. Tiring of the sea and the thankless

* Fortunately for its botanical interests no goats are allowed on the island now.

task of seeking fortunes on it for others, this old American sea captain had apparently followed

“The good old rule, the ancient plan,
That he should take who has the power,
And he should keep who can.”

At any rate, he had settled on the island with his wife and two sons, and Mr. Parsons, seeing no chance of recovering his goats or his island, returned to the Caymans.

Such, then, with the exception of a period in which a Guano Company exploited the island for phosphates, are the “short and simple annals” of our little island.

Perhaps, with a spice of “insular prejudice,” we may feel inclined to spare some of our sympathy for Parsons; but remembering all the hospitality we received during our stay on the island, we can only wish “the man in possession” the best of luck. We are, indeed, sometimes tempted, when our thoughts stray back to his beautiful sea-girt home, to envy him; for Swan Island comes very near to being the coral island of one’s dreams. It is ideal not only from the æsthetic point of view, but from the practical—it ought to pay its way as a fruit-growing concern. It would make as fine a biological station for the study of pelagic and deep-sea life as one could wish to have. It has a climate which would not hurt a baby; and lastly, with a pretty bungalow erected on the “lawn” at its west end, it would make an ideal “haven of peace” for a “tired millionaire” to visit on his yacht for a couple of months or so every winter.

“Ah! yes,” you say, “delightful, charming, lovely, but. . . after all—a beautiful prison.” Not at all! For even allowing that you had no private craft of your own, you could get away from it almost when you liked. You could even have your weekly or monthly magazines or periodicals sent out to you, to say nothing of the latest novels and anything in the way of provisions or groceries that your required.

In a word, you could be playing at Robinson Crusoe and still keep in touch with the world, lagging after it little more than a week or so. "How is it done?" Why, this is a very up-to-date coral island, and it has a wireless telegraph installation on it. The owner has allowed the "American Fruit Company" to erect it for the purpose of forwarding messages from New Orleans to their fruit plantations near Port Limon in Costa Rica. These messages cannot reach all the way, so they give them a fresh start at Swan Island. These tall, lattice-work towers seem, no doubt, considerably out of place in a Robinson Crusoe island. From an æsthetic point of view they are, we must confess, a rather jarring twentieth century blot—a monstrous outrage—as well have a motor garage in the Garden of Eden—but in return for the accommodation, the owner of the island can stop any of the Company's steamers by simply hoisting a flag to the top of his flagstaff, which stands just outside his house.

"Yes," you say again, "but how often does he sight one?" Well! it so happens that Swan Island lies nearly in the direct track of vessels making down from New Orleans through the Yucatan channel to Port Limon or Carthagena, or *vice versa*; and it also so happens that the navigation over the Honduran banks, and in this region generally, is particularly tricky. Consequently it is the custom for vessels making this passage to sight Swan Island and so make an absolute certainty of their position.

Thus, as far as these happy islanders are concerned, the difficulty of getting the Company's vessels to stop, of keeping up communication with the outside world, and of getting rid of produce raised on the island is reduced to a minimum. But also please note how history has repeated itself, if in rather an inverse way. The buccaneers used to waylay ships passing through this danger-zone and rob them. This far-seeing American has posted himself on the same trade track and intercepts the vessels for a more legitimate purpose. In the long run the result,

after all, is much the same. While we were on the island as many as one or two steamers a week or three a fortnight seemed to be quite the usual thing to see passing. At any rate they said it was. Could anyone want more? If they did, they might as well live at Tilbury Docks.

But life on isolated coral islands, such as these, is not *all* honey and sugar and unalloyed bliss. You cannot have all sun, without little scraps of shade; and one was conscious, from time to time during our stay, of passing shadows, of little rifts in the lute, of unsatisfied cravings for society, of a yearning on the part of these Hyperboreans for normal human intercourse.

One day in our wanderings we came across a little shaded sanctuary in the woods—a pathetic little garden, quite formal with its trim paths and conventional beds, and all in strange contrast to the wild scenes of vegetative revelry which surrounded it. Mingled with various exotic shrubs which flaunted their gaudy blossoms in all the richness of tropical display, there were humble friends from northern and more bracing latitudes—old and cherished links with the past—and in one spot, which some one obviously regarded as the very shrine of this retreat amid the trees, were some English roses. These roses were doing their pathetic best to blossom, but they looked thoroughly tired, and *they were without a scrap of scent*. Need we labour our point?

I have a keen recollection, too, of how even the dogs which the islanders possessed, seemed somehow to accentuate the absence of this human element. There was one especially—an Airedale terrier—which used to come with me on some of my bird-nesting tramps; a friendly pal who made the woods and the grass-grown rides, which have been cut from one point of the island to another, seem less lonely.

This dog's greatest delight was to retrieve fish from the sea. Whenever we wanted bait for fishing purposes, the "laird" used to throw a small dynamite cartridge into the water at the head of his little harbour. In a

moment the surface was a glittering mass of dead or struggling multi-coloured forms; and "Joe" was dashing in and out, swimming here and there, seizing fish in his mouth and apparently swallowing gallons of salt water at the same time. When we say that on one of these occasions, we carried 171 fish on board the yacht to be placed in the refrigerator, all killed by one small discharge, it will give the reader an idea of the multitudes which swarmed about the island and its reefs.

Poor, dear old fellow! he as good as told me, when we were sitting together on one occasion in the woods, that he got just a little bored with the island at times. Iguanas, he said, were all very well at first, when you were young and unaccustomed to them. They made you think a bit. But, of course, their terrifying appearance was all bluff. In fact, he had begun to wonder lately if he was really justified in the sport of hunting them.

Then he suddenly changed the subject, and looking up with his great "speaking" brown eyes, asked me if I wasn't an Englishman, and if I could tell him anything about Yorkshire and Airedale, where his people had been born and bred?

So I did my best to tell him.

CHAPTER III.

A TALK ABOUT BUCCANEERS.

ONE afternoon, after stowing away in the refrigerator* the birds which we had shot during a ramble in the morning, I went ashore again ; walking over from the little bay on the south side of the island, where the yacht was then anchored, to have a chat with the " laird."

I found him on the verandah of his bungalow. Here, he could generally be found towards the cool of the day, smoking and reading, or gazing dreamily across the sea in the direction of far distant Honduras or Yucatan. The verandah faced due west, and from it one's eye could travel over the wide piece of level turf which swept down to the head of the bay, where we first anchored, and take in the bold sweep of the palm-strewn headland forming its northern limb.

This afternoon, the long-backed rollers, relics of last night's swell, were smashing themselves into clouds of spray among the massive blocks of coral limestone at its far extremity. Upon the grass in front of us, some turkeys, and as nice a lot of poultry as one could wish to see, were free to wander at their own sweet will. A little way off, a donkey nibbled at the short grass ; while almost on the edge of the beach some Alderney cows were

* Birds put into this refrigerator came out weeks afterwards as fresh and unspoiled as when they went in. After one of Sir Frederic's cruises to the West Indies, I skinned a canvas-back duck on June 5th, which had been shot in Mexico on February 26th.



A BIT OF THE HOME Paddock WITH COWSHED AND
WOODS IN BACKGROUND.

[To face page 24.]

tethered under the shade of some trees. It was a scene straight from Arcady, and a more charming site for a bungalow one could hardly wish to have owned.

We sat and smoked, and presently the talk fell upon buccaneers. "Had I seen their breastworks at the other end of the island?" Well, no, I had to confess, I hadn't as yet, having been too keen to make the most of the birds and see what there was to be seen at this end. "Ah! well," said the "laird," "there are some there right enough, and I guess the old sea-robbers used this island as a sort of watch-tower guarding the approaches to the Yucatan Channel. It was like this, you see. In the old days, when the Spaniards ruled the roost, their trouble was to get their ships home safe to Europe from the Spanish Main. Now these ships couldn't go beating eastwards against the Trade-winds all down the Caribbean Sea, and then away out across the Atlantic, with the wind against them all the way home; let alone when they were heavily freighted with all sorts of treasure and stuff from their so-called Colonies. So all ships going home from Carthagena, the Panama Isthmus, Boco del Toro, and such like fever-stricken spots as they were then, used to make northwards with the current and wind for the Yucatan Straits. Once through these, they would call at Havana, get a final fit out, and so make home with the Gulf Stream and the westerly winds, which are the rule further north. Now if you look at a good map, or better still a chart, you'll find a big submarine bank sticks out from the corner of Honduras, stretching across half-way over to Jamaica. Well, this bank, I take it, was a pretty ticklish proposition in those days of rough charts, and still rougher instruments to navigate with; and so they had to give it a wide berth, which narrowed their fairway down pretty considerably; for mind you, they would fight shy of getting too close to Jamaica. And so, as I size up the state of affairs, after Mr. Spaniard had got clear of the bank, why, he found Captain Swan or some other of his friends waiting there right in his track to cut him

off; and a nice hash they made of him too, more often than not, I'm thinking."

"Yes, yes! I think this island must have been called after Captain Swan the buccaneer."

"There's another island away south of this, off the Mosquito coast, called Old Providence—ah! you know it perhaps—got some rare birds on it, has it? Well, there was a famous buccaneer called Mansveldt* went there; had a regular big turn-up with the Spaniards, and took the island with this same notion, I guess, of using it as a station for worrying their ships on their way home. Very likely some of his men used to come to Swan Island. The only thing against it would have been that there's no really comfortable riding for a ship here when there's a blow, as your people found this morning, and had to move round to the south side. Otherwise they could have stayed here as long as they liked, stocked the place with stores, and held the key to the western outlet of the Caribbean. Why, I reckon that with a little bit of a breakwater the States might find this a handy place for the same purpose when the Panama Canal is finished—it would make a snug little station for torpedo boats, and no mistake."

"But what," I interrupted, "made the buccaneers choose the north-east corner of the island to stick up their breastworks and anchor their vessels off? Why, they would have been on the weather side of the island there."

"Ah! well, if you walk over to-morrow you'll find a curious sort of bight in the coast, and across it a reef, inside of which there is smooth water. You can see the gap in the reef where they brought their vessels through, and once inside the reef they would have been fairly snug. But there's a funny thing about it too, for to-day there's hardly enough water for a smack to anchor in; from which I calculate, either the waves on that weather shore have been piling in a good deal of coral sand and rubbish to

* This was in 1664. Mansveldt had fifteen vessels, five hundred men, which he had collected at Jamaica.

shoal the water up very considerably, or the island has been slowly rising a bit since the days of the buccaneers nearly two hundred and fifty years ago. The first may have had a good bit to do with it, but I fancy there's something, too, in the last notion. I've seen it shoal up myself—enough to notice—during the twenty years and more I've been here."

"Of course, mind you, I wouldn't swear the old dogs ever did ride there actually at anchor, for they may have simply used the place to run their vessels ashore—careened them as they called it—to scrape off all the weed and barnacles on their bottoms, and they may have thought Swan Island a nice quiet, out of the way spot, which no Spanisher would bother his head about, where they could come and do the job without fear of being surprised. All the same, you may take it they weren't going to take risks; so when the ships were lying there, canted over on their sides, some of the guns would be hauled ashore and stuck down behind the breastworks in case of an attack."

* * * * *

In all probability these buccaneers were the very first men, certainly the first white men, ever to set foot on Swan Island; for there does not seem any reason to suppose that the Mosquito Indians, who lived along the shores of the mainland, ever had a settlement on the island, or were even likely to have visited it. These Indians were, as we know from Dampier, notoriously skilful with their canoes, and were past-masters in the art of harpooning turtle and big fish; but ninety-eight miles of open sea would have been a very formidable voyage to undertake in their cockle-boats, even if there had been any good object in going so far, or even if there had been any likelihood of their hitting off such low-lying islands. Moreover, as the shores of Honduras swarmed with turtle and fish of every kind and description, even the quantities present around Swan Island would have presented no attractions.

We often used to visit the little buccaneer bay which the "laird" had described. It simply breathes of romance, buried treasure, and "desert islands." You stumble out of the hot stifling woods, tired of dodging trees and spiders' webs, suddenly to find the cool clean Trade-winds fanning your exceedingly hot and moist face. The "white horses" are playing out at sea; the wind soughs among the fringe of cocoanut palms along this weather shore, and sends the spindrift flying up the sandy beach like flecks of foam dashed from a charger's nostrils. Occasionally a gannet comes swooping over the trees; and as it passes, it turns its head in your direction and then glides off over the broken water in the direction of Little Swan Island, whose whole northern side, one can see from here, is densely overgrown with bright green trees and bushes.

Looking straight out to sea in a due easterly direction, as you do from here, you realize that there is no speck of land between you and Guadeloupe or Dominica in the Lesser Antilles, a matter, may be, of fourteen hundred miles.

The beach is strewn with drift from the whole length of the Caribbean, and the dead remains of creatures which lived among the growing coral, which is gradually filling up the bay. Sponges are a noticeable feature of all this flotsam and jetsam. We filled our collecting bags one afternoon with a dozen different kinds—some were simple branched forms, others beautiful structures in the shape of goblets or flower vases; many took the forms of long, parallel, hollow cylinders, rather like the pipes of an organ; others were curious hollow, tube-like structures, mere skeletons of the animal which produced them, whose thick walls seemed as if fashioned out of amber-coloured spun-glass, arranged in a densely intricate network; while a few took the form of mere flattish mats or the more familiar shape of our washing sponges. Under the shade of the cocoanut palms we found a rough, deserted hut, built of a framework of poles, which was

covered with palm fronds. It had been made, we afterwards found out, by a solitary, self-invited guest from the Cayman Islands, who had sailed over here to catch turtles. All sorts of odds and ends had been left lying about it, both inside and outside, denoting, apparently, a very hurried departure. A sort of shackle bed in one corner was covered with some very dirty sacking; there was a rather ingenious open-air fireplace, where the man had done his cooking; some torn magazines strewed the floor, and a melancholy look pervaded the whole place, suggestive of a shipwrecked mariner. They told us that the man had been given leave to fish there on certain conditions, but had transgressed some unwritten law or other, and so had had to "up and git." These people stood no nonsense with poachers, and the "laird's" eldest son, who acted as deputy-governor, ruled the island with a rod of iron, backed up when necessary with a revolver.

Our poaching friend who had occupied this deserted hut must have had a lonely time of it, sleeping, no doubt, through a good part of the daytime, and watching the beach from the door of his hut for the turtle as they came ashore at night. We could picture him sitting there through the long dark tropical hours with the ghostly rustling of the palm-fronds above his head, and the moaning of the surf upon the distant reef in his ears. From where he sat he could see the creeper-covered breastworks of the buccaneers, and the opening in the reef through which they used to "con" their vessels.

Did he, we wondered, when he kept his lonely vigils, ever conjure up visions of those bygone days, nearly three hundred years ago, when the sturdy, dare-devil adventurers were busy scraping away at their grass-grown ships, lying canted over on their sides in the shallow water; or did their ghostly forms occasionally throw down their ghostly tools with a ghostly oath, and come gliding up among the trees and undergrowth to throw themselves down and loll upon the sand by his side? Perhaps they

talked to him of treasure, hidden here in the sand beneath the breastworks, treasure which for one good reason or another, often associated in some queer way with yard-arms, they never had the chance to come back and dig up. Perhaps they yarned and boasted to him of their ghastly, bloodthirsty deeds, brave as some of them must have been ; perhaps sung a ghostly song or two—"Yo ho ho ! and a bottle of rum,"—or made disparaging remarks about the degenerate milksop ways of the twentieth century. Perhaps Mansveldt himself, or Swan, or any of those other valiant souls who had such a short and merry life in the Caribbean, occasionally sneaks ashore of a night in this little secluded bay, so cunningly hidden from the prying eyes of passing vessels.

Perhaps they do, or perhaps they don't ; who can say ? But, at any rate, I do not think I should fancy sleeping of a night in that ramshackle hut beneath the ghostly rustle of the palms—it looked too creepy.

CHAPTER IV.

ON THE SUBJECT OF TURTLES.

ON the subject of turtles, the "laird" more than once held forth for my benefit as we sat on the verandah, and I am sorry enough that the notes hurriedly jotted down, as the result of our conversations, are so meagre.

Considering the high price that is paid for the flesh of the green turtle—how dearly we love to consume it as soup, when we get the chance—and what an immense number of pretty things are made from the shell of the hawksbill turtle, it is surprising how very ignorant we are still of the ways and habits of these well-known reptiles. As a matter of fact, comparatively very little is known of them. There is a great gap in their life-history. The female comes ashore to lay her eggs, as every schoolboy knows, and famished shipwrecked sailors, from times immemorial, have rushed towards her with convenient poles to turn her over on her back. With a confiding trust in Providence for the future development of their eggs (somewhat suggesting the methods pursued by the ultra-fashionable modern lady in respect of her nursery), those lady turtles which have escaped capture during their brief sojourn ashore put out to sea again and are no more seen. In the course of time we know that these eggs hatch, baby turtles scramble and wriggle through the deep layers of sand which have covered their nursery, and all with one accord rush helter skelter down the sun-baked slopes of sand to their foster-nurse—the wide, open sea, which is waiting there to do her best for them and to mother them.

But after this there is a huge blank ; we know no more of them until at some future time an infinitely small percentage returns again to the dry land to start once more the life-cycle. Of the life, the habits, the rate of growth, and the whereabouts of the juvenile turtles we know as little as we used to know of the metamorphoses of the common eel. It is the almost universal belief that the eggs of the turtle* are hatched by the agency of the sun, which conveniently keeps the sand at a nice warm incubating temperature. If you sprawl on the slopes of a tropical beach and run your fingers through the burning sand, the deduction, inaccurate as it is, is very excusable. Unfortunately for the inference, the mother turtle scoops out a deep hole, and ultimately reaches a level at which the sand is not only uniformly moist but uniformly cool. In this cool but equable temperature, the eggs, covered of course with sand, remain for a time which, so far as I am aware, has not been accurately determined. Brown Goode says the hatching is done in about three weeks. Agassiz, on the other hand, says it cannot be less than seven. Possibly the time varies according to the different species, or different latitudes ; I could get no very definite information on this point from the islanders.

What is known for certain, however, is that the moment the wrinkly-looking, leathery-white eggs are hatched, the young rush to the sea. The islanders had seen this interesting performance over and over again, and on many occasions had carried the newly-hatched turtles a little way from the beach up into the woods. Here they would deliberately place the turtle with its back to the sea, with the idea of making the youngster lose its bearings. The result was always the same. In a moment the little beast had swung round in the right direction and was toddling away, fast as its baby legs could carry it,

* We are talking more especially of the green turtle (*Chelone midas*), but the same thing applies to the hawksbill (*Eretmochelys imbricata*) and the loggerhead (*Thalassochelys caretta*), and all three visit the shores of Swan Island.

straight for the sea. Once arrived there, these miniature turtles scurry away in all directions, but always *over the surface* of the water, for, strangely enough, at this stage of their existence *they cannot dive*.

This is the last that the islanders see of them. How long it is before they are able to dive, like their grown-up relations, is apparently unknown. Neither is it known, I believe, what constitutes their food at this early stage, but it is very probable that they live on the minute algæ and animalculæ, with which the surface of the sea swarms in early summer, or that they may even scrape the rocks for their coating of Nullipores. The infant mortality * at this period of the turtles' existence must be enormous. They are literally between the deep sea and the devil, if we may imagine the devil on this occasion in the guise of the frigate-bird, with its black body and huge outstretched wings. The frigate-bird, according to the "laird," is as fond of infant turtles as an alderman is of turtle soup, and what with these avian epicures above and the many carnivorous fish below, these youngsters must have but a sorry time of it.

The "laird's" second son, who has taken a medical degree at one of the leading American Universities, told me that he had constantly watched turtles coming ashore to lay their eggs. This they do three, if not four, times a year. The breeding season lasts from about the end of April until July. The question of a suitable site for a nest is apparently a matter of some careful deliberation. The lady turtle, or "hen" as she is called, does not rush ashore and blindly dig a hole in the first convenient slope of sand she lands on, but she will probably choose three or four places and commence digging at each, before finally settling on a spot which suits her. Having made up her mind on the question of the mere selection of a suitable

* Mr. Wood Jones in "Corals and Atolls" (p. 330) says that in the Cocos Keeling Islands a repulsive looking eel (*Ophichthys colubrinus*, var. *annulata*), which is boldly banded with black and white and lives in the sand of the lagoon, is very fond of young turtles, which it destroys in large numbers.

site, the "hen" puts out to sea again, where may be, she rejoins her mate, who never comes ashore. All love-making is carried on out at sea, and I have myself, in the case of the loggerhead, been a spectator of these tender moments. About ten days after the choice of a nesting-site, the "hen" returns to it, scoops out a hole in real earnest with her fore and hind limbs, and lays her eggs.

According to my medical informant, who has actually timed the performance, the whole process of digging the hole and laying perhaps one hundred and seventy eggs may be over in fifteen minutes. Even if we allowed her another five or ten minutes, this seems to us to be quick work with a vengeance.

It is said that the same "hen" will return two or three times in the same season to nearly the same spot, and each time lay about the same number of eggs, which must bring her annual total somewhere up to the average of four or five hundred. Considering the helpless condition of the newly-hatched young, which apparently have little or nothing in which to hide, unless it be among floating patches of gulf-weed, these numbers do not seem at all excessive.

In addition to the heavy infant mortality that goes on, full grown, and doubtless half grown turtles have their enemies. Thus, I once saw, in company with Lady Wilton, the following unconsidered trifles taken from the stomach of a large leopard-shark on the shores of Captiva Pass, in Florida: (1) Perfect specimen of a cormorant (*Phalacrocorax dilophus floridanus*), with plumage entire and barely spoilt; (2) Large loggerhead turtle; carapace was broken into four or five large pieces; (3) Three "weak" fish (*Cynoscion nebulosus*) each about 3lbs. apiece; (4) One fairly large whip-ray and two smaller ones; (5) A variety of odd bones and several silver mullet which apparently had been thrown overboard of some yacht or boat as unfit for bait.



A LIVE LOGGERHEAD TURTLE ON BOARD THE YACHT.

[To face page 34.]

On the same afternoon, I might add, another shark seized a tarpon which I was in the act of landing, and which must have weighed fully one hundred pounds or more. It rushed away with the fish, and after a dogged tussle of about five or ten minutes' duration, in which the shark seemed to be sulking on the bottom with the tarpon in its jaws, the line came back slack with about five or ten pounds of the tarpon's flesh attached to my hook. Strangely enough, this chunk of flesh seemed to have come from the region of the tarpon's shoulders, although the fish had been originally properly hooked in the mouth.

The green turtle is considered to be a strict vegetarian. It is undoubtedly very fond of what is known as turtle-grass (*Zostera marina*), which grows in shallow water near the shore, especially where there is a good deal of fine silt or mud; but I much doubt if we have any right to be so certain that it never varies its menu by occasionally indulging in a little animal diet, or if turtle-grass is anything more than an item in its menu at certain times of the year only.

The "laird" informed me, for instance, that regularly every spring the thimble jelly-fish (*Linerges mercurius*) drifts past the island in countless swarms, and that the hawksbill turtles simply gorge themselves on them.

The loggerhead, as compared with the green turtle, lives certainly and chiefly on an animal diet; its food consisting of fish, crustacea, various species of sponge, and shell-fish, especially conchs. Its flesh is consequently very nasty, and even the Cayman turtlers, when off the Mosquito banks, will not touch it. The hawksbill turtle they will, on the contrary, eat with pleasure, and its diet would seem to be intermediate between that of the green and loggerhead.

No one seems to be able to tell the age of a turtle. There are turtle fishers at the Caymans, for instance, who have had years of experience on the banks, and yet in the case of an adult cock or hen, of say something

over a hundred pounds, they have not the faintest idea whether it may be only two years old or as much as twenty *; nor more had the "laird."

We have already referred to the acute sense of direction, which the young turtle exhibits when first hatched, a degree of acuteness which, after all, is not so very much greater than that of young ducks or other water-birds in finding their way to any water; but it would appear that in the adult turtle this sense may assume proportions which are very much more wonderful. Most of the turtles, for example, which the Cayman fishermen catch, are taken off the Mosquito Coast, which lies three hundred miles to the south of their islands. Now turtles which have been caught there and taken to the Caymans to be kraaled (or put into the turtle-ponds) have escaped from time to time after their arrival, and have been subsequently found again off the Mosquito coast. It has, indeed, been asserted by old turtling hands that they have been retaken *among the very self same rocks from which they were originally netted*. It is impossible that any mistake could be made in regard to their having been caught before, for every turtle caught is branded with the private mark of the vessel capturing it. On this passage of three hundred miles there is no favourable drift to set them on their course; indeed, during these passages, if the turtles swam on or near the surface they would not only have a cross wind, in the shape of the prevailing Trades, but would have a cross current to deal with, viz., the Gulf Stream drift, just beginning to "draw" through the Yucatan Straits, which would set them constantly westwards off their almost due southerly course. Here, then, we apparently have a "homing" instinct possessed by the turtle which is on an equality with that of the swallow, pigeon or other birds, and which seems to us to be quite remarkable.

The hawksbill turtle, as we have already hinted, also comes ashore at Swan Island. They are much rarer than

* A very old turtle is generally covered with barnacles.

the green turtle in the Caribbean Sea, and are also much more valuable. At the time of our visit the "laird" told me that the shell was fetching eight dollars a pound. It is not to be wondered at, therefore, that an eager look out was kept for the arrival of these turtles during the breeding season, and that they were regarded as a valuable item in the natural productions of the island. What surprised us, however, was the small amount of shell that an adult hawksbill supplies. This only averages from two and a half to four pounds, although an extra good one will produce as much as six pounds. When, however, one reflects that the "shell" simply exists as more or less thin scales or "plates," which form merely an outer epidermic covering to the bony skeleton, which constitutes the dome-like carapace, it is not so surprising. For those who are curious in such matters, it may be stated that there are three rows of such "plates," viz., a central and two lateral, the central row containing five plates and each lateral four. In addition, the margin of the carapace is occupied by twenty-five small fringing plates. In the "trade" the plates of the three rows covering the back are known as "blades," while the small marginal ones are called "noses." Those which have the highest market value are the two middle "blades" on each lateral row, for the simple reason that they happen to have the greatest thickness and size. Plates are of more value if the patches of colour are of nearly equal size and occupy about the same position on both sides.

CHAPTER V.

BIRDS AND SOME BIRD-PROBLEMS.

THERE are some islands which are so small and isolated that the mere presence, or the mere absence, of certain birds and animals on them, lends them just that touch of interest which they would not otherwise possess.

If the bare truth be told, we were, after two days spent in a thorough search through the woods of Swan Island, just a little disappointed with what we found. This was because there are so few purely *resident* birds. On the other hand, the mere fact of the absence of several representatives of families which are, with one or two striking exceptions, found uniformly distributed throughout every island in the Caribbean Sea, made it all the more interesting. There are, for instance, on Swan Island no humming-birds, no members of the tyrant family (with the exception of occasional visitors on migration), no finches, no ground-doves of the genus *Chamæpelia*, and no honey-creepers of the genus *Cœreba*, a genus which is, with the very strange exception of Cuba, distributed universally throughout the West Indies. The only other islands in the Caribbean, not mere rocks, on which there are no humming-birds at all are the three Cayman Islands.

These "sins of omission" give, as we have said, a spice of interest to small isolated islands. They provide little problems for solution. Why humming-birds, for instance, should not be found on the neighbouring Caymans is

just one of those strange mysteries, probably quite simple of explanation in reality, but which at present we cannot solve. All we can say, from a personal and purely human experience of the conditions found there, is that there seems no reason in the least apparent why they should not be. But then we might just as well quarrel with the fact that orchids (one of which—*Schomburghia thompsoniana*—is quite peculiar) are found in abundance on the Caymans, while there are none on Swan Island.

After an early breakfast, on the morning following our arrival, we immediately turned our attention to exploring the western island. This island is about two miles long, with an average breadth of half a mile. It looks simply made for birds. Thick woods alternate with open clearings, which are either given up to the various crops and fruit trees grown by the islanders, or towards the eastern end of the island indicate areas from which phosphates were once dug. We found plenty of birds in these clearings—nearly always the best places to look for them—but most of them were winter residents only.

When we first made the acquaintance of tropical islands, and were new to the task of quickly getting a comprehensive idea of their bird life, I remember we did not sufficiently realize this. Perhaps there are others who, equally inexperienced, would find the same difficulty. Birds are flying about everywhere—at least in the open spaces—and one is very apt to gain a false impression of what the islands can fairly lay claim to as their very own. The number of species, for instance, which Mr. Townsend and I between us have found, beyond any question of doubt, upon Swan Island amounts to thirty-nine. From information which I received from the islanders, there seems to be no question that at least ten other species are sometimes met with. Probably many more than this occasionally wander here, or pass through on migration. At any rate, one could fairly put the grand total, without straining things in the least, at something over fifty.

Yet out of this total there are only *ten* which can be said to be really residents, and this, as we shall see, is stretching the list to its utmost possible limits. These ten species comprise: (1) The vitelline wood-warbler (*Dendroica vitellina*), (2) The bald pate pigeon (*Columba leucocephala*), (3) The Swan Island thrush (*Mimocichla rubripes eremita*), (4) The larger frigate-bird (*Fregata aquila*), (5) The red-footed gannet (*Sula piscator*), (6) The common booby (*Sula sula*), (7) The little green bittern (*Butorides virescens*), (8) The cat-bird or Carolina thrush (*Galeoscoptes carolinensis*), (9) The black cuckoo (*Crotophaga ani*), (10) The myrtle-warbler (*Dendroica coronata*).

I have said we have stretched the list to its utmost limits, because in the case of Nos. 8, 9, and 10 we were not able to satisfy ourselves, with any absolute certainty, that these birds really do remain all the year and breed on the island. No 8, the cat-bird, belongs to the family of mocking birds, and was quite common. It is a sleek, neat-looking bird, rather smaller than the English song-thrush, and spends most of its time under cover in the thick undergrowth. Its call-note reminds one of the mewing of a cat, and it has a general body-plumage of slate-grey, with the top of the head black and the wings and tail blackish, and under tail-coverts chestnut. Many and many a time, as we wandered to and fro in the thick woods, perspiring from every pore, and getting our faces covered with spiders' webs, which were stretched in countless hundreds from stem to stem, we said things about this bird which in our cooler moments we should have been ashamed of; because from its skulking habits and dark appearance it used to lead us on to stalk it, under the impression that we were *at last* after a living specimen of No. 3, the Swan Island thrush proper.

There was nothing we wanted more than No. 3, but anyone was welcome to the cat-bird, which has its summer home in temperate North America, and only comes down to the West Indies to winter. The Swan Island thrush, on the other hand, was supposed to be one of the island's

very own productions, peculiar to it alone. The owner of the island informed me that the cat-bird remained with them all the year, but he could not remember ever having found a nest. I have therefore reluctantly been compelled to note it as a doubtful resident, for it would have been distinctly interesting to have made certain that it bred here ; since outside the limits of the mainland, the Bermudas, as far as I am aware, are the only islands on which it has been found to nest. In these last islands I have found several nests of this bird, and one could hardly wish to see a more alluring sight than the beautiful eggs they contained, with their deep Egyptian or peacock-blue colour, absolutely devoid of spots. Cat-birds from Swan Island do not differ in any way from those found on the mainland, which is another reason for thinking they cannot be really resident, or, at any rate, have only very recently become so ; although, on the other hand, it is extremely difficult to persuade oneself, as some have done, that Bermuda birds differ from mainland ones.

When Mr. Townsend visited Swan Island in 1886, he obtained some specimens of No. 3, the Swan Island thrush, which were thought to differ from the one found in the western end of Cuba, and it was accordingly looked upon as a sub-species of this Cuban thrush. Whether it really does exist on Swan Island to-day we cannot say, for though we hunted high and low for it, and scoured every nook and corner of the woods, never a sign of it did we see. Every collecting party that left the yacht was implored to keep a strict look out for it and bring one back "dead or alive." Day after day some of us would start out bent on finding it. Some were continually imagining that they had *seen* one. It came at last to be a sort of "hidden treasure" thrush. Many of the crew, who had never been known before to exhibit the slightest taste for ornithology, used to wander about the island peering into every bush they came across. "Good morning, have you seen the thrush?" became nearly as common a question as the one so unforgettably associated

with a certain well-known advertisement. Some of us, I think, nearly got the thrush "habit." But it was all no good.

As a matter of sober fact, Mr. A. said he sometimes saw some in October, but October is a month of gales and hurricanes, and it is possible that these birds had been blown here from Cuba, or even from the Cayman Islands. Why, too, should one only be able to see a resident bird in autumn on such a small island? And so we write No. 3, too, as a doubtful number, or possibly extinct.

Number 9, the black ani or "savanna blackbird," as it is sometimes called in the West Indies, is *now*, on the other hand, an almost certain resident. It is, moreover, an interesting one, in spite of the fact that it is also met with in many of the West Indian Islands. When Mr. Townsend was at Swan Island in 1886 he met with none of these birds, whereas at the present time there are at least four or five flocks. It is impossible that he could have missed them, and they have not been "introduced," so it seems certain that at some date between his and our visit they have been blown here and have established themselves.

These weird looking birds, with their extraordinary parrot-like bills, which are thinned off along the strongly arched upper-border into almost a cutting edge; with their long tails and uniformly glossy black, or nearly purplish, plumage, are, though of the cuckoo tribe, a sociable sort of creatures. They follow one another about, uttering a strange melancholy mewing sort of cry, which has been variously interpreted as "Going awa-a-ay," "How-d'ye" or "Ani-Ani." In other localities where they are found, these cuckoos frequent open spaces or the wooded margins of savannas, and this was just where we came across our first flock on Swan Island. A point of interest in their being found here now lies in this predilection for open clearings, for until comparatively quite recent times Swan Island was uniformly and densely wooded. With the arrival of the phosphate diggers and the present

owner, clearings were soon made, and as the clearings came into existence so apparently did this black cuckoo. Its nearest neighbours live in the Cayman Islands, one hundred and eighty-five miles away.

This bird, which, unlike some of the true cuckoos, builds its own nest—and we may add in contradistinction to the British schoolboy who wrote the famous essay—“lays its own egg,” is practically omnivorous, but it has a distinct regard for cattle ticks. It will find nothing like these loathsome creatures on Swan Island, which, when we were there, contained only one or two Alderney cows, and the ticks of these will surely not be enough to go round. Apparently the birds have recognised this fact and have turned their attention to local dainties, for in the stomach of one we found four lizards, and the remains of several large beetles.

Swan Island is not the only island of which we have evidence of the approximate time of colonisation by these birds, for writing of Tobago in the “Annals of Natural History” (Vol. IV., 1840, p. 163) a Mr. Kirk says: “I am informed that the first pair seen here was in the years 1822 or 1823.”

Seeing how well known the bird is in the West Indies, it is rather remarkable how little is really known for certain in regard to its very peculiar methods of nesting. It is generally supposed that many females of this species make use of one large and common nest, in which they lay eggs sandwiched in between layers of sticks, leaves and grass, but, as far as I am aware, no recent naturalist has ever placed on record the results of his actual observations in connection with this curious fact. In or about the year 1847, Sir Wm. Jardine endeavoured to obtain evidence on the subject from the Mr. Kirk we have already mentioned, and the results of his researches were published in the “Annals of Natural History” (Vol. XX., 1847).

Finally, among the doubtful residents of Swan Island we must put down No. 10, the myrtle-warbler. This small bird, about the size of a spotted flycatcher, is a

native of North America, and spends the winter "down south." The point of interest about it is that in the Grand Cayman, where we have found it fairly abundant in any open grassy clearing, it is said to be resident and to breed. Unfortunately, I made no notes on this point with regard to the Swan Island bird, but I have a distinct recollection of being told it remained all the year. If the suppositions in the case of either or both of these islands prove correct, we have here a case of a migratory bird not only extending its breeding area, but becoming non-migratory, and we can see how easy it will be for these insular birds, in the course of time and under changed conditions of climate and food, to become differentiated into new species or sub-species.

Myrtle-warblers were the first birds we saw after landing. They were flitting about in a clearing made for the wireless telegraph station. We saw several other flocks on the island, but always in similar clearings and near the edges of the woods, and when disturbed they immediately flew for safety to the trees. I am inclined to think that this bird must be more of a seed-eater than any of the large family of wood-warblers (*Mniotiltidæ*) to which it belongs. It can only be a recent addition to the avifauna of Swan Island, for it is not likely to have been present when every inch of ground was covered with thick woods. So much, then, for doubtful residents.

Of the rest of our list, the frigate-birds, and both gannets, are undoubted residents, and we shall have some remarks to make upon them in describing Little Swan Island. No. 7, the little green bittern, also breeds here, and Mr. Townsend considers it to be distinct from species found elsewhere, in the West Indies, so that we are left with only two to say anything about. These are the vitelline warbler and the pigeon.

It would be difficult to mistake any of these birds for anything but residents or aborigines of long standing. They are so tame that it is obvious they have lived here for centuries untroubled, until quite recent times,



A CORNER OF THE YACHT DEVOTED TO ORNITHOLOGY.

[To face page 44.

by the presence of man. The difference in this respect between them and any of the other birds living here (excluding the gannets and frigate-birds) is so striking that it could not fail to be obvious to the least observant. The pigeon in other parts of the West Indies, such as Jamaica, is extremely shy and suspicious, practically as much so as our European wood-pigeon. Gosse, in his fascinating "Birds of Jamaica," says "Wary exceedingly, the bald pate, from his seat among the topmost twigs, discerns the gunner, himself unseen, and intimates his vicinity only by the rushing of his strong wings, as he shoots off to some distant part of the grove." Yet the bald-pate of Swan Islands, especially the eastern island (they are getting a little wary on the western one because the islanders shoot them) are noticeably and surprisingly tame as compared with those on other islands. On the eastern island they are, indeed, so confiding that I shot eight with a small forty bore collecting gun, hardly more than a toy, in about twenty minutes. I did this, not for *sport*! but because I thought at the time they differed from the birds of other islands, and I wanted a series to make sure. There was *no* sport in it. They seemed like helpless innocents.

The bald-pate is a fine handsome pigeon. Its general colour is greyish-blue. The crown is pure white, running into a band of dark purple at the back of the neck. On each side of the neck is a beautiful "cape" formed by feathers of metallic green, rounded at the ends, bordered with black, and having a neatly patterned effect. The pupil (iris) of its eye is white, and the bare space round the eyes is also white. There is nothing peculiar about its nidification. It was quite a common bird on the islands, and one could hardly go anywhere in the woods without hearing its plaintive homelike notes "Cōo-rī, cōo-cōo; Cōo-rī—cōo-cōo," repeated over and over again.

Coming hot and tired from long tramps in the clearings, where the tropical sun blazed down in the afternoons with a quiet but relentless fury, we often sat ourselves

down in the cool shade of the trees and listened to this soulful love-song. It seemed to speak of slumberous summer afternoons, of old English rectories with velvety lawns stretching down to weed-grown, sluggish streams; of green water meadows where the cows stand swishing their tails, by the hour, under the shade of fine old English trees.

I was told by the islanders that in times of great drought, these pigeons make excursions to the mainland in search of water. They have been seen flying away in the morning in great flocks to cover the ninety-eight miles of sea which separate the island from Honduras, and noticed again on their return in the evening of the same day. Whether it is lack of water, or lack of sufficient food as a consequence of the want of rain, which renders these journeys necessary we cannot say; but we can well imagine that these occasional daily migrations must have had a sensible influence in the introduction of seeds of trees and plants to these isolated patches of coral in the midst of the Honduras sea. Even supposing, as Kerner has contended from the results of his experiments, that seeds in the excrement of pigeons are incapable of germination, we may easily imagine there would be plenty left in their crops on their return to the island, when, tired with their journey across the water, any of them might perchance fall an easy victim to a hawk. By a catastrophe of this sort at such a moment, any seeds in the crop of the pigeon would be scattered and spread upon the ground by the sharp talons of its murderer.

The vitelline warbler (*Dendroica vitellina*) is perhaps the most interesting bird to be met with on Swan Island, for it is peculiar to this island and Grand Cayman, and is found nowhere else in the world. On Swan Island it is infinitely more abundant than on Grand Cayman, and exceedingly tame and unsuspicious. That it nests on Swan Island there is no doubt, for we have shot and described * specimens which exhibit various stages of the plumage of quite young birds. We have, however,

* See "Ibis" April, 1909.

never found its nest. In adults the plumage is brightly coloured, being yellowish olive-green and a clear lemon-yellow below. Above the eye there is a thin streak of yellow, and a crescentic spot of the same colour below it. A few very faint olive-grey streaks are seen on the sides of the flanks. It is about the size of a canary.

There is another warbler called the prairie-warbler (*D. discolor*), which has its home in the United States, and only visits the West Indies and occasionally Swan Island and the Caymans in the winter time. Although very similar to the vitelline warbler, it is smaller* and has also distinct and constant differences in its plumage, which render it easy for the expert to recognise the two birds as distinct species. We may therefore regard the vitelline warbler as an offset, or insular race, of the more dominant and continental prairie-warbler.

It is very difficult, and even if we had the ability, it would take too much space here, to formulate a satisfactory explanation of why and how an offset from a dominant and migratory species, like the prairie-warbler, should have come to lead an isolated and non-migratory existence, as we see this Swan Island race has done. The subject is bound up with the complicated one of migration and all its problems. But, at any rate, we have an indication, although it is not an explanation, of how new species or sub-species may come to have their first inception and lose their migratory habits in the case we have quoted above of the myrtle-warbler. We might quote another instance in the case of the migratory American "redstart flycatcher" (*Setophaga ruticilla*), which only lately appears to have become entirely resident in the island of Dominica; or again of *Dendroica dominica* and *D. tigrina* which are said to breed occasionally in Jamaica; of the blue-winged teal (*Querquedula discors*); and the spine-tailed duck (*Erismatura jamaicensis*), both of which have become permanent residents in the Grenadines. Altered conditions of climate and environment, together with the

* A point worth noting.

mere effects of isolation, will, together with other things, lead in the end to changes of plumage and dimensions in these birds, if they remain permanently resident, just as they have done in the case of the Canary Islands chiff-chaff (*P. rufus fortunatus*), a sub-species of our European chiff-chaff.

But how came these birds thus to drop their migratory habit? Did the climate and the conditions generally, in the Canaries, gradually come to fulfil exactly throughout the whole year the requirements of the chiff-chaff, and so gradually do away with the necessity for periodical migration? Under these conditions we can conceive that those birds which did return annually to Europe in the spring would gradually become fewer and fewer, until at length there would be none left, and this migratory branch-route north to south or south to north would cease to exist, and the Canary Island birds would be cut off from any autumnal influx of birds which had bred in the north, and would be completely isolated.

But if this is the explanation in the case of the Canary Island chiff-chaff, it can hardly hold in the case of the myrtle-warbler and redstart flycatcher, which must surely have found the conditions obtaining in summer, on the Caymans and Dominica respectively, totally different from the conditions they had been accustomed to on the continent during their breeding season.

Why, again, pick and choose in such a capricious way? In what manner, for instance, do the conditions found in Cuba differ from those of the Caymans, or those found in the islands immediately to the north and south of Dominica, from those of Dominica itself? Yet in Cuba we find no variety of the prairie-warbler which is resident; and Dominica alone, out of all the Antillean Islands, appears to have been chosen by *Setophaga ruticilla* for a permanent residence.

* * * * *

This reference to the subject of migration leads us on to consider the migratory visitors to Swan Island. Every

autumn there is a vast tidal wave of bird emigration from the northern division of the American continent to the southern and central divisions (which last includes the West Indian Islands), and vice versa, every spring ; just as occurs at the same seasons in the Old World from Europe and Asia right away down to the nethermost limits of Africa and the more southern divisions of the eastern hemisphere. Silently and mysteriously, this avian game of " musical chairs " begins as the first cold shadow of winter spreads over the north polar region ; and from this circumpolar starting point the tidal wave of birds flows southwards along the main land-tracts of the earth, gaining in amplitude as it sweeps southwards in every direction. Again in the spring another mysterious summons starts the return wave flowing in a northerly direction.

Practically everyone in England, old enough to realize anything at all, is perfectly aware that cuckoos, swallows, nightingales, and many other such-like birds, arrive and depart at certain times of the year : but there are doubtless an enormous majority who regard this simply as a special peculiarity appertaining to the British Isles—a kind of dispensation of Providence to enable the Britisher to realize that autumn and winter are upon him, or to give him a pleasant thrill of expectation at the outward and visible evidences of approaching spring and summer. They have never thought, or never realized, that this same nightingale is cheering the watcher anxious to hear its notes once more in Copenhagen, Germany, and parts of Russia, and, if we are not too particular about small specific differences, even in far distant Persia. Nor, perhaps, have they realized that the dweller in the United States of America or Canada has, in just the same way, his harbingers of spring, which arrive from the south, and that he is no less joyful at their advent.

And so it is, even on our little Swan Island, where at least forty of its fifty species are there to escape the rigours of more northern climates, or simply put in an appearance

for a few days and then pass on their way either north or south, according to the season.

Those which remain for the whole winter are there, we might almost say, on sufferance. They are foreigners making use of a comfortable wintering place. Take for instance a little flock of turnstones, which we came across one day along the rocky cliffs bounding the little bay, used in old times by the buccaneers. These little birds were so tame that they allowed us to approach them within a few feet. There was a high Trade-wind blowing at the time, and they seemed to be sheltering among the medley of huge coral boulders littered along this windward shore. It was only when we rudely intruded upon their privacy that they flew on a few yards. In the act of settling again, their white under-parts became for a moment visible, and then, instantly, the birds remained motionless, and as if by magic seemed to disappear under one's very eyes—plumage and rock becoming blended into one homogeneous and undefinable blotch of vague colouring.

No wonder they were tame, although all unconsciously they were demonstrating the efficacy of protective colouration. In the whole course of their winter stay in Swan Island they would hardly set eyes on a human soul. Perhaps we were the only humans who had troubled to scramble along this rock-strewn shore—their chosen abiding place—that winter. And where had they come from? On what far-distant northern shore did they make their shallow meagrely lined nests, among the scanty herbage? Why, thousands of miles north in Arctic regions, desolate, wild and uninhabited; perhaps somewhere along the shores of Hudson's Bay, in Smith's Sound to the north of Baffin's Bay, or on the western shores of northern Greenland. And here their young would first set eyes on the world, but never or hardly ever on a human being. As the summer days begin to shorten in these northern regions, and the cold nights make scarce the food these birds find under the stones along the bleak

shores, they are driven south, working their way down all the eastern length of North America, until at last they arrive at this little coral island basking in perpetual sun. What a contrast, and what a journey! Get your map, we pray you, and consider it.

But there are other shore-birds which find their way to Swan Island and remain for longer or shorter periods. Probably a complete list of those which at one time or another have visited the island, or which regularly pass through on migration, would include the greater part of the shore-birds, waders, and water-fowl of the West Indies.

One never, or with the rarest exceptions, sees these winter migrants speeding their way over the broad seas to reach their appointed wintering places, no matter for how many months one may be cruising from island to island. Yesterday the rocky shore knew them not; to-day, as we walk along its edge, a wisp of delicate little spotted sandpipers (*Actitis macularia*), or even the smaller semipalmated sandpiper (*Ereunetes pusillus*), flick away in a tight little bunch over the wet sand or skim like a streak of silvery grey just beyond the waves before they break.

“ Into this Universe, and *why* not knowing,
Nor *whence*, like water willy-nilly flowing ;
And out of it, as wind along the waste,
I know not whither, willy-nilly blowing.”

* * * *

What, without asking, hither hurried *whence* ?
And, without asking, *whither* hurried hence ! ”

We have seen, too, a flock of Wilson's Plovers (*Ægialitis wilsonia*) here. They hung about the southern shores of the island during the whole time of our visit, and Mr. Townsend has seen the yellow-shanks (*Totanus flavipes*), a bird which corresponds to our red-shank. But these five species are the only shore-birds which have been actually recorded.

We were told by the islanders that in the autumn months—October and November—several species of duck

drop in here for a few days on their way south to the mainland. Once they shot forty canvas-back in a week; and American widgeon, shovelers, a few pin-tail, in addition to blue-winged teal, seem to regard Swan Island as a land-mark in their bi-annual migrations from North to Central America or vice versa. The sora rail (*Porzana carolina*) is another occasional winter visitor to the island, having been recorded by Mr. Townsend.

At these busy seasons of migration there is always an influx of birds of prey, which apparently follow upon the tracks of migrants and harry the straggling weaklings in the rearguard. We have ourselves seen the peregrine-falcon (*P. anatum*) and the little American merlin hawk (*Falco columbarius*) on the island, also a fine specimen of the osprey (*Pandion haliaetus carolinensis*), which was here for other purposes, and Mr. A. told us the red-tailed buzzard (*Buteo antillarum*) is a constant visitor. They call it the "chicken hawk."

But we have wandered from the subject of Swan Island's regular winter residents; and if we want to see them we must go into the woods, or hunt about for them along their margins on the edge of the clearings. Here we shall find them in plenty creeping about in the thick undergrowth or searching the curious leaf-like stalks of the phyllanthus for insects. Most of them belong to the large family of American wood-warblers (*Mniotiltidæ*).

You have not gone far, for instance, before your attention is attracted by a little bird which reminds you of our tree-creeper. It is the black-and-white warbler (*Mniotilta varia*) which has its proper home in eastern North America. This bird has the habits of both a creeper and a warbler, and ten to one is clinging to the smooth copper-coloured bark of an Indian birch (*Bursera*) or creeping up and down the branches of a bitter plum or dyewood tree. Another, but very much rarer bird, has the same habit of clinging to the bark of slender trunks of trees, where it searches the nooks and crannies for insects. This is the worm-eating warbler (*Helmitherus vermivorus*). It breeds

in the eastern United States, but winters in Central America, as well as Cuba and Jamaica and the Bahamas. Spiders are said to form a great part of its food. If this is true, it ought not to starve on Swan Island, for the woods simply swarm with them.

Then come a whole host of pretty little insect-eating warblers which belong to the genus *Dendroica*, a genus which has spread itself all over the West Indies, the whole of Middle and North America, and some parts of South America. All these birds are merely passing the winter here. They have come from various parts of Northern America, arriving about September, and going back to breed in their native haunts as soon as April arrives, bringing its abundance of insect life among the newly bursting foliage up north.

There, for instance, is the little parula warbler (*P. americana*) flitting about among the thin leafy stems of herbaceous shrubs—a fairy garbed in a spangled dress of blue, yellow, orange, black, and white. There, again, is a yellow-throat warbler (*D. dominica*) with a streaky dress of black and white made resplendent with a striking gorget of deep lemon-yellow. Further on you come across a black-throated blue-warbler (*D. caerulescens*), whose name bespeaks its livery.

Now you stumble on a bird creeping almost like a mouse, and almost as near the ground, among a tangled mass of low bushes covered with convolvulus. Ornithologists know it as *Geothlypis trichas*, but we will call it here the Maryland yellow-throat. It is, strictly speaking, the short-winged northern yellow-throat, so if you want to be very precise and scientific, you can tack on the word *brachydactyla* to the tongue-twisting Greek words above, for there are many varieties of this little bird, which has a habit of varying its plumage and dimensions according to the localities it is resident in, almost as mysteriously or unreasonably as a modern lady. To read a list of the scientific names which have been given to the varieties of this unfortunate bird would give you the impression

that it was extremely ugly. In sober truth it is one of the most lovely little birds, both as regards colouring and shape, that we know. No mere words could convey the least idea of the "artistic" colouring of this sleek, mouse-like bird, and of its no less fascinating movements. What is the use, for instance, of saying that its back is "plain dull-greyish olive-green" if you have not seen the delicate tint which these words endeavour to express, or how subtly it contrasts with the bird's jet black "mask," the canary-yellow of its chin, throat and chest, the ash-grey of its crown and the pale buff of its under-parts?

It would be tedious, however, to go on much longer describing the birds which live among these woods during the winter. I have only one excuse to offer to the reader for having already stretched this chapter to such a length. It is the interest which any bird seems to have for us when it lives on an isolated and diminutive island.

I shall therefore simply mention three other visitors. One of these was the American redstart (*Setophaga ruticilla*), with its startling contrasts of black, pale-orange, saturn-red, and white; another was a delicate little bird like a very diminutive song-thrush, which, from its habit of frequenting the margins of ponds and morasses, has received the popular name of water-thrush (*Seiurus noveboracensis*); while the last was the white-eyed vireo, a soberly coloured little songster, which Lady Wilton christened the "spring bird," because it reminded her of the willow-wren. It was a happy name to give it, far more descriptive than its scientific one of *Vireo noveboracensis*, for it has a careless happy lilt, which speaks to one of spring days and primrose-studded woods. We might have placed this last bird among the list of doubtful residents, for some are said to spend the whole year in the island of Jamaica, and it is rather suggestive that the only one which we shot differs in some respects from typical examples, a fact we only discovered after leaving the island.

CHAPTER VI.

CORALS AND CORAL REEFS.

“Where the sea-egg flames on the coral,
And the long-backed breakers croon
Their endless ocean legend
To the lazy locked lagoon.”

Rudyard Kipling.

OWING to the fact that there is no very reliable anchorage at Swan Island which suits in all sorts of weather, one has occasionally to dodge round from the bay at its western end, to an anchorage on the southern side of the island or vice versa, according to the direction of the wind.

When we found ourselves for this reason or another on the southern side, the yacht was anchored about three hundred yards or so outside a miniature barrier-reef, which stretches across the mouth of the little bay, which we have already referred to in a preceding chapter. The water here was between fifty and sixty feet deep, and so marvellously clear that one could see the very smallest object on the bottom with ease. On calm days in the early morning, when as a rule there was not the faintest ripple on the surface, the sun lit up the wonderful world beneath us, till I think we could almost have seen a shrimp moving, either upon or above the sand, or in and out among the coral clumps and sea-weed far down below.

So clear, indeed, was the water here, that the “laird” told us that only quite baby sharks would dare to venture into it or care to frequent it, and that it was safe to bathe from the yacht. We made the experiment *once*, but all the time could never quite get rid of the uncomfortable

thought that the "laird" *might* be mistaken. On such occasions of misgiving it is strange how one's toes seem to feel such a very long way down.

A much queerer sensation was felt in diving from the top of the gangway ladder, a matter of perhaps twelve feet or so above the water. As one stood for a moment, preliminary to taking a dive, the sea-bottom was so startlingly visible that the water between you and it, fully fifty feet deep as it must have been, seemed simply non-existent; and as you plunged in you had a momentary sensation of having deliberately hurled yourself head first on to the hard bottom far beneath you.

Inside the little barrier reef the water of the lagoon, even on rough days, was as smooth as glass. To get into the lagoon one had to row round between the eastern end of the reef and a little bush-grown rocky promontory, which jutted out seawards and guarded the bay from the easterly swell.

The lagoon in its small way fulfilled all the conditions of what a lagoon should be. It was full of wonderfully coloured fish and various forms of living coral. Upon the bare water-worn sides of some of the more massive forms of coral, from which the actual polypes had long since disappeared, lived, among other fascinating objects, hosts of sea-urchins with the longest spines we had ever seen; some of them were six inches or more in length. The deep water at the foot of the rocky promontory was the home of giant cray-fish of a most alluring flavour. Nullipores, millepores, sea-fans, sea-anemones, everything in fact both strange and beautiful which appertains to an enchanted sea-garden of this description lived and flourished in this small lagoon.

No sooner had the dinghy carried you across it, and landed with a gentle grate upon the sandy beach, than you had an irresistible desire to be playing at "desert islands." You felt that you must immediately set to work to build a hut, look for turtles' eggs, or catch fish for your dinner from the rocky headland. Behind you were the woods

ready to be explored, with the trees sweeping right down to overshadow the beach ; in front of you the wave-battered reef and the still lagoon, and nowhere the faintest possible token of the presence of man.

On the north side of the island there was another, but much longer, barrier-reef, stretching across a long and gently curving indentation of the shore. Both these reefs, and the lagoons they include, would furnish a splendid hunting ground for the zoologist. In company with Mr. Gillam, the second officer, I spent several happy mornings in a more or less amphibious condition upon the reefs and shore of the northern lagoon. We used to get one of the steam-launches to tow us round in a flat-bottomed tarpon-boat—a hastily constructed home-made affair, which, from her entirely irresponsible behaviour in anything like rough water, was christened the "Saucy Lizzie." She was a fine craft for bumping about among the coral-heads and for accommodating our somewhat messy and slimy treasures, but unless prepared to swim ashore at a moment's notice, some might have found fault with her, and said she had too many whims.

On our first visit to the lagoon I had provided myself with some fishing-waders and brogues, fine things in theory for scrambling about on half-submerged masses of coral, or even for sitting half submerged in the "Saucy Lizzie," but poor affairs in practice, when waves were constantly surging over the coral, making one stumble and flounder about or fall through the great ragged holes, made by the solvent action of the water, and also speedily filling the waders. So first these came off, and then, as our enthusiasm increased, various garments followed, until finally we were left with nothing on but a pair of brogues to protect the feet, and a simple birthday suit. This left one free to be happily and carelessly marooned on patches of isolated coral, which had grown up to a foot or so beneath the surface ; and perfectly independent, too, of our bucking craft, or of the swell, which, just inside the barrier-reef, occasionally came surging along and

threatened either entirely to submerge us or to wash us clean off our patch of coral. It also allowed one occasionally to dive off the edge of it to explore at shorter range some particularly tempting colony of polypes which grew down below at its base ; or even to make a perfectly futile attempt, while under water, to dab wildly with the landing-net at the shoals of variegated fish which dashed in and out of the great submarine cavern-like spaces. But although the water was so deliciously warm that we could have stayed in it all day long, this sort of thing was too fearful a joy not to have its drawbacks. We had forgotten the sun, which, while we were busy watching the fairy scenes below, crouching the while upon our insecure and slippery platforms of living coral, had been busy too upon our backs. We realized it well enough and painfully enough later on, when we discovered that this part of our body was the colour of a boiled lobster and a mass of large watery blebs, the result of sunburn. But everything has its price, and I do not think we really grudged this one that the coral reefs extorted.

One lives and learns by unpleasant experiences, which are, after all, often sweet to look back upon ; and even when in our innocence we picked up with our fingers a marine worm-like creature, which lived in the crevices of the rock, and which was covered with long, silky-white hairs like glistening spun-glass, and got badly stung for our pains, I do not think the worm could have objected so very much to what we said in our haste about it ; for it must have felt that it had much the better of the encounter, even though it had found itself crammed into the crowded space of our collecting bottle. The sting from this worm lasted for the best part of two days, due to the fact that the ends of the glass-like glistening hairs break off sharp after penetrating the skin.

One has sometimes, however, a far more unpleasant companion while swimming about these lagoons, and it is well to be aware of it, for it is a real danger and more to be feared, according to the islanders, than the ever

present fear of sharks, which, indeed, very seldom come into such clear and shallow water. This is the barracuda (*Sphyræna*), a fish which bears a very close resemblance to our pike, and which, when it attains to a weight of thirty or forty pounds, is liable to make a rush for a swimmer's legs.

But despite drawbacks such as these, what a fascinating new world it all was to explore: for everywhere beneath the translucent water was spread out a garden in which was displayed, not the dead empty husks of coral organisms, such as one sees in fusty museums, but the real *living* thing itself; not the pale colourless spirit-sodden things in glass jars, which perforce have to do duty for tropical specimens of fish in our national or provincial collections, but the God-painted animate things themselves; not, in a word, the drab inert figments of life, but the sentient soul of it in conscious harmony with all around it. For just as it is only in the very forest itself that one can properly appreciate the wonderful adaptations in colour and form presented by its living inhabitants; so, here only, can one begin to get a glimmering perception of how each form of life observed, was adapted to its surroundings and had made the most of them.

The submerged masses of slowly rotting rock on which we were trying to balance ourselves were, for instance, carpeted here and there with thinly spread coral colonies of *Porites*. They grew as (or rather took the outward form of) thin sheets or nodular undulations of a greenish yellow or mauve colour, and were smooth and slippery, with a sort of mucoid secretion, so that the hand slipped swiftly over their surface. It was not easy to distinguish the individual polypes, which, now that the swell was constantly surging over them, appeared to have withdrawn themselves into their uniform fleshy carpet (*cænosarc*); but one could appreciate the use of this slimy secretion, which allowed the water to pass over them with the least possible friction and resistance. No other form of coral could well have grown in such a position;

and it was obvious from the very patchy nature of the colonies and the riddled surface of the coral rock elsewhere that even they had a hard struggle to exist. On the rough uneven surface of these coral platforms, life indeed existed for them along no easy lines. They were buffeted by waves, constantly injured by the impact of coral debris or the deposition of coral sand. The very rock, which was the produce of their own secretions, was being exposed to the solvent and disintegrating action of the water, the borings of worms and molluscs, and the parasitic like growths of nullipores, or even of other forms of coral.

Very different was it if we crawled to the edge of our submarine island, and with the aid of a fish glass peered over into the depths below, where all was still and at peace, or comparatively so. Jutting out from the sides of the rock we could, for instance, see another coral colony growing some five feet down. This colony belonged to another species of *Porites*. It grew as long, slightly branching and finger like processes of a bluish mauve colour. Each long process was smooth and rounded and about a foot long. The whole colony was firmly rooted to the rock ; so that when we passed the boat hook round its tough base we had the greatest difficulty in pulling it up. Nothing could have looked or felt so little like what one had generally thought of as coral. It felt soft ; one could bend each long finger-like branch almost as easily as an asparagus shoot ; and with one slash of the knife slice them through and through. But again one could easily appreciate that it was only by reason of its position in the still and sheltered water beneath the overhanging rock that the form of it was possible. In other places this species, or one remarkably like it, grew as tufts in the coarse sand.

A little further down was another branching mass of coral—the magnificent tree-like form of a *madrepore*. It grew in a great spreading tuft, like a splendid chocolate-brown fern, or the flat branching antlers of a stag. Again we lowered the boat hook and passed it round the base

of one of its branches. As the iron struck it, it rang with a sort of clink ; and after some trouble we hauled the whole thing up and signalled for the boat. The flattened growing surfaces of this coral were thickly covered with live polypes, each of which when closely examined looked like a very diminutive or almost microscopic daisy, and which was to all intents and purposes a very minute sea-anemone. The only essential difference between these little polypes and the ordinary sea-anemone was their size, the fact that they were growing in colonies which had been produced by the continual throwing off of buds by specially differentiated polypes, and lastly, that they possessed a calcareous skeleton which had been secreted by their outer coat (*ectoderm*). Thus they possess, in common with other corals, a mouth, a gullet or stomodæum, tentacles, and a central digestive cavity with its mesenteries, on which are situated the reproductive organs, all of which are essentially similar to those found in the sea-anemone.

In many places on these large flattened out branches, the only thing that was left to mark the spot where former polypes had lived and flourished were their calcareous skeletons. They stood out prominently from the general surface as diminutive cup-shaped structures of coral limestone (corallites), like so many monuments to the dead. This skeletal structure is as necessary to the existence of these kinds of *Actinozoa*, as bones are to any other animal. Except that the coral-forming polype chooses to secrete its "bones" by means of its outside dermal covering, instead of secreting them inside, as in, say ourselves, there is no fundamental difference between the skeleton of a coral polype and the skeleton of a vertebrate animal.

We do not "secrete" *our* bones in a conscious manner ; or for the purpose of later on providing skeletons for exhibition in a museum ; or for the purpose of increasing the stock of inorganic substances available for the maintenance of future vegetation ; nor more does the coral-forming polype. But it is a very common belief that

these animals secrete all this limestone in much the same way that a bee manufactures its comb; that unconsciously they are "working" to produce tons of calcium carbonate which will one day go to form the foundations of a tropical island; that countless millions of generations fall fainting by the way and are trodden underfoot, pushed down and built upon, by as many more living millions of generations which carry on, for ever upwards, the colossal fabric.

How grievously the processes of coral growth and coral life generally, in addition to the processes of formation of coral atolls or islands, have been thus misconceived, it would take too long to indicate here. Suffice it to say, that if it had entirely depended on the efforts of the coral polypes, alone and unaided, no coral island would ever have been possible.

It is the sea-waves, which by smashing, pounding, and pulverising their colonies to pieces and then piling up the disintegrated fragments one on top of the other, put the crowning finish to a process, which commences (as in the case of Swan Island itself) by the elevation of submarine eminences to a point within a comparatively short distance from the surface. Reef-building corals cannot grow in deep water because of the sediment which would fall upon them in such a position. It is, therefore, only when they have a foundation to grow on which is swept by currents of clear water, and so is above the level where sedimentation can take place, that their growth is possible. If we eliminate wave-action, it is obvious that the corals would simply grow to a uniform level immediately beneath the surface, and there all growth would cease.

Among corals a rough division can be made between those which secrete calcium carbonate or coral, and are thus chiefly instrumental in the formation of reefs and islands; and those in which the secretion formed consists of some horny material, plus a few spicules of limestone, which play but a very inconspicuous part in reef pro-

duction. The coral-making colonies are again divided into two groups, viz., (1) in which the individual polypes are of equal value in the process of multiplication; (2) in which there are certain specialised polypes in which alone the process of budding occurs.

The specimen which we had hold of belonged to the second group; that is to say, there were certain dominant polypes in it which had gone on budding and throwing off new and younger polypes from the very commencement of the life of the colony; which were still in a position to create, and which would go on creating younger generations until the destruction of the whole colony or their own accidental death. These specialised polypes differed from all the rest in being larger, and in being symmetrical; and it was perfectly easy to identify them in the specimen which we had secured from the still water beneath our rock. They were situated at the very ends (growing points) of the branches, and were the most ancient and hoary members of the whole colony. Every now and then they produce, in addition to the ordinary inconspicuous and non-creative polypes, individuals like unto themselves, which may, under certain circumstances, start new branches. It therefore follows that some of these "dominant apical zooids" (as Mr. Wood-Jones calls them), *must be a great age*, for there seems to be no limit to the duration of their life, except from accidental circumstances. It also follows that if the colony has been allowed to grow under absolutely favourable conditions, one of these zooids, which started it, must be older than all the rest—an ancient venerable ancestor whose age must be reckoned in years, and which would stand alone in royal isolation at the very top of this ancestral madreporian tree.

These facts, which bear on the subject of the potentially immortal nature of the coral polype and its method of growth, when entirely free from accidental disturbance, are so utterly at variance with preconceived notions, as to make the study of corals and coral islands even still

more wonderful and fascinating than it was before. We are accustomed to regard the life of these coelenterates as so fleeting, and their structure as being so frail and lowly, that when we are told that we must reckon the age of some of them on much the same scale as that of quite the higher classes of animals, it seems to be something completely startling.

There were, of course, other forms of coral to be seen about these reefs and lagoons, or upon the banks outside them ; brain-corals (*Meandrinæ*) for instance, which seem to prefer to live for choice among patches of marine grass like *Zostera*. These brain corals are beautifully adapted with means to get rid of the frequent showers of sand or mud which, in such situations, must be constantly falling upon them ; but the grass, may be, acts as a sort of screen, and saves them a good deal of work and inconvenience.

From the purely æsthetic point of view, however, there was nothing to compare with the really gorgeous display made by a huge bed of sea-fans (*Rhipidigorgia flabellum*) which grew among the broken fragments of rock off the north-west corner of the island, close to the entrance of the northern lagoon. The water was deep here, and the current ran sharp and strong and clear, so that their beautiful spreading fans—some of them bright purple, others a bright mauve—waved to and fro on the rocky bottom, and produced an entrancing effect. It was hard work pulling these pliant corals up from the rocks among which they grew like masses of ferns. We lowered a grappling hook to do it, and in wrenching them from their horny grip, came once or twice within an ace of capsizing the "Saucy Lizzie." Instead of "coral" these colonies of polypes secrete a black, horn-like material, which forms the basis of the fine network of branches on which the polypes grow, and the branches are only covered with the merest film of "coral" proper.

Gillam was a splendid hand at collecting on a reef ; and he made furious onslaughts on the great rotten lumps of coral, which he dragged up with an indomitable will

from beneath the water. When our flat-bottomed boat was so loaded that it looked like a Thames barge laden with hay, we used to row or swim with it ashore, and there sort out our treasures on the sandy beach and stow them away in bottles.

Among the innumerable crevices and holes in these pieces of coral rock, or embedded in masses of an encrusting kind of sponge of a bright vermilion colour, we found myriads of small crustaceans, molluscs, worms (marine), serpulæ, young star-fishes, and even young fish. Most of the animals living in this sponge were protectively coloured, simulating the bright red of the sponge itself. A prawn (*Alpheus*) which we found in a coral block fished up from the bottom, two miles out from the south side of Swan Island, is peculiar in possessing symmetrical claws, and in having the eyes covered with a sort of hood.

The rocky pools on the beach, where we sorted our catches, swarmed with small and very pretty gasteropod shells, each of which was inhabited by a hermit crab (*Clibinarius*). Another crab—the mole-crab—(*Remipes scutillatus*) was rather common on the sandy beaches round Swan Island. You can see them being swept up the slope by an advancing wave, and then as the water retires, they burrow and hide themselves in the sand with almost the rapidity of thought. In collecting a few specimens we had to follow up the retiring wave and burrow after them as quickly as a fox-terrier; otherwise, by the time the next wave had swept over their hiding-place all trace of it would have been lost, except for a minute breathing hole.

But, I fear, we added absolutely nothing, during these dilettante visits to the reefs, to the vast amount of knowledge already accumulated by zoologists in these directions; but as we thoroughly enjoyed ourselves, and certainly added to our own little store, there was some little satisfaction in the thought.

Among the multitudes of tiny, but gorgeously-marked fish, however, which lived down below among the

spreading branches of the coral, or swam in and out of the mysterious caverns at their "roots," there was one species, among those we caught, which proved decidedly interesting. This was a blenny (*Enneanectes carminalis*), and Mr. Regan, of the Natural History Museum, informs me that it has never previously been found anywhere but on the Pacific coast of the American Continent. The interest of this find lies in the fact that it might be regarded as yet another link in the already long chain of evidence which goes to prove that in past geological ages* Central America was sunk beneath the sea; or at most formed a chain of isolated islands, allowing the Pacific to join hands with this western area of the Atlantic; or to flow eastwards over these regions as a mere gulf, whose eastern limits were controlled and shut off from the Atlantic by the Lesser Antilles, then a very much elevated and continuous chain of mountainous country, now but mere sunken relics of it. In other words, at these periods, there was a free communication between the blennies of the Swan Island region and their Pacific colleagues, which since the final emergence of Central America has been interrupted.

These blennies are as a rule quite small fish, which live in nooks and crannies of the coral rocks or among masses of sea-weed. The examples of the species we have referred to were from one and a half to two inches long. Another species (*Clinus nuchipennis*) we procured from the same reef ranged from six to eight inches. Blennies, however, are not all so small as this, for in more northern seas, where there is a far greater amount of food to support them, there is a gigantic blenny called the "sea-wolf," which grows to a length of six feet. Besides these blennies, there were innumerable other small perch-like fish which lived and swam in small shoals in these fairy grottoes. It would be tedious to give them their scientific names, which Mr. Regan has kindly done for our private edification: all we need say is, that the effect

* Eocene, Cretaceous, and possibly before.



A MORNING'S CATCH WITH ROD AND LINE BY LADY WILTON.

[To face page 67.]

produced by the extraordinary variety and brilliance of their multicoloured bands and markings was simply and literally kaleidoscopic.

This marvellous colouring of coral-haunting fish is a topic which has been "done to death:" and for those who have seen it with their own eyes, there is hardly a more tempting subject on which to grow enthusiastic. But these fish are just as curious for their extraordinary variety of form and shape and many modifications. There was one, for instance, the rays of whose dorsal fin had been modified into strong spinous processes which let down and could be completely hidden in a trough-like groove on its back. The first of these rays was more or less isolated from the rest, and was as strong, rigid and pointed as a steel dagger. When erected, no force that we could apply with our fingers was strong enough to push it back into this groove. It resisted every effort; and until you had discovered the secret, it furnished an amusing puzzle, which was never solved until a slight touch on the spine, immediately behind it, released the lock which held the first spine so immovably in its place. This fish (*Balistes*) has in consequence been called the trigger-fish.

Other fish have teeth which remind you of a sheep's. These are brightly coloured fish which are in the habit of "browsing" on submerged coral rocks, scraping their smooth water-worn surfaces for the sake of feeding on the nullipores or minute algæ which thickly encrust them. Others have trailing flexuous fins which recall the gauzy draperies of those alluring ladies who display their sinuous forms in the multicoloured limelight of the stage. Some are like zebras of the sea, with alternate bands of bright yellow and black. Others are all black with a single sinuous band of bright cobalt-blue.

The same sort of thing, but on a larger scale, greets your downward gaze on the "banks" which are found extending outwards from the southern and western limits of these islands. In the intervals of fishing over them, it was good to take a "fish-glass," immerse it beneath the

ripple on the surface, and lose oneself in the mysterious stillness of the world beneath. The water over these banks, as we have said before, is gin-clear. There are, may be, eight, nine or ten fathoms of water, that is to say, anything up to sixty or more feet; but a bright tropical sun lights up the fairyland below, so that you can see with ease the smallest object upon the bottom, even to those animals which by means of their mimetic colouring seek to render themselves inconspicuous upon the sand and coral mud. And among groves of sea-fans and waving zoophytes; in and out of dark and mysterious grottoes; and over bright stretches of white coral sand, the multicoloured procession of fish passes like a silent pageant of another world. Some, as we have already said, are striped like zebras or wonderfully coloured perch; some are in coats of exquisite enamel; some in vivid scarlet with white spots; some in a motley of orange-blue and turquoise-green. Fish there are here, both large and small, fish of all shapes, perch-like, turbot-like, eel-like, and even box-like. Beautiful fish and ugly fish, but fish everywhere; some good to eat, some poisonous, some living and browsing among the waving fronds of seaweeds, some lying or crawling upon the bottom, others lying in wait ready to dash upon their unsuspecting prey.

It is a world of fish, a world of colour, and a world of apparent peace and lazy bliss; but a world, nevertheless, of constant struggle and ever present tragedy.

In spite, however, of the last undoubted facts, we may perhaps be excused for quoting a line or two of Mr. F. G. Aflalo from his "Sunset Playgrounds," where he describes very similar scenes on the Coast of California. "They give a glimpse of the perfect peace. You drift, as in an airship, over lovely gardens in which gorgeous creatures dart in and out of amazing tangles of flowers unknown above sea-level. No dust troubles the canyons of their mountain gorges. No voice breaks the stillness of their groves and thickets. Their blooms have no scent. They are God's gardens of sleep."



A HEART-STRAINING JEW-FISH OR SEA-PERCH (NOTE THE FISH
TAKEN AS BAIT).

[To face page 69.]

CHAPTER VII.

FISHING AND SPORTING FISH.

ON most days, as soon as breakfast had been comfortably disposed of, it was the custom of Lady Wilton and Sir Frederic to be towed out to the banks to spend the morning fishing.

So far, we have attempted to sketch the more æsthetic side of these banks from the point of view of their gaily-coloured inhabitants ; we shall now describe them from their sporting aspect.

Including sharks, there are at least half-a-dozen fish to be met within a mile or two of the islands, which ought to satisfy the most blasé and travelled angler in search of fresh ground and fresh conquests for his rod and line. Indeed, although so isolated and difficult to arrive at, the "laird" told me that he had had more than one request from American fishing clubs to allow them to build a club house on the island for the sake, not only of the excellent sport to be had, but of the splendid climate and the complete charm of its surroundings. Happily, as we thought, he had preferred his privacy to the doubtful position of being a sort of club-caterer and worried landlord.

During our cruises we had made the acquaintance of pretty well every fish that could be caught in Florida "passes" or Mexican rivers ; to say nothing of the vast lagoon-like inlets and the many rivers to be found at intervals all along the northern coasts of Cuba. In these

varied localities Lady Wilton had proved in many a fight with tarpon, shark, king-fish, hurel, and heart-straining jew-fish, that she was a "master fisherman." We have known her to catch a two-hundred pound tarpon without a scrap of assistance. Another giant which had to yield to her skill weighed one hundred and sixty-eight pounds. We have seen her kill and beach a one hundred and twelve pound jew-fish totally unaided, in a workmanlike fashion which might have been envied by many an angler with stronger arms and sinews. Many a lithe and active young shark of forty, fifty, or more pounds has been brought by her to the gaff, when fishing with light rod and fine tackle that we should hardly be ashamed to be seen with on a trout-river.

And now there was waiting upon these banks the sporting and matchless queen-fish (*Acanthocybium solandri*) with which to try conclusions. We all tried our luck with them and failed; all, that is to say, but her ladyship, who caught two—one of forty-eight pounds, the other of sixty-eight. For some reason or other at the time of our visit these queen-fish were not so plentiful, or as large as usual, having no doubt strayed further afield in search of other food. As a rule they average any weight from sixty to a hundred pounds or over, and for sheer good sport they would, among sea fish, be very hard to beat.

Imagine a mackerel of these proportions, and you have a rough idea of the queen-fish. In colouring, however, they are not so silvery; the under-parts being of a whitish-yellow or yellowish-white shade, and the sides streaked with bands of a dark steely-blue. When seen in the clear water following up a spinning bait they have a "tigerish" look. They are indeed the tigers of these banks. Out of the water, just after being freshly caught, every line in the almost artificial symmetry of this fish gives one the impression as having been designed for the very acme of speed and agility. If you have not already got this impression, the fish by its behaviour will speedily



LADY WILTON WITH THE SMALLER OF HER TWO QUEEN-FISH.

[To face page 70.]

make it plain to you ; that is to say, if you are lucky enough to hook one. In some ways they reminded us of a Whitehead torpedo, and, indeed, they looked almost as artificial. With a snout tapering off with nearly mathematical precision and with a deadly potentiality for dealing a lightning-like blow ; with a tail and caudal peduncle so artificially chiselled and so beautifully proportioned that they simply "speak" of something designed by a masterhand for the final word in motive power ; and with a long tapering body almost mechanical in its fine cut lines ; you have before you a very clipper of the submarine depths.

To some of the slowly moving fish which live upon the banks this five or six feet of materialized activity must often appear like the very personification of Death ; for with indicators set at "full speed ahead" it looks as if it could go clean through a six-inch plank.

It is not difficult to imagine, that with a piece of animal mechanism of this lively potentiality at one end of a fishing-line, things are liable to "hum." And according to Lady Wilton's account they do.

A queen-fish gives you no time to think. As you sit on your chair in the stern of a slowly moving tarpon-boat, watching your silvery bait twist and spin some three feet beneath the water and some forty yards astern ; a streak of yellowish light suddenly appears from nowhere in particular, and before you have time to gasp the fun begins. There is no nonsense about this fish. Having made up its mind that it wants that alluring little eight inches of shining bait, it takes it in one red-hot lightning rush—crash—h—h—h.

Up goes the rod ; the tip bending like a piece of quivering steel. "Scream, scream, screamity-scream" yells your Vom-hofe winch with its two hundred yards of line. "Sizzle zip—zip sizzle" rips the straining line as it cuts its way like a knife through the water and hums like a telegraph wire in the wind. There is no time to breathe. You have a feeling that something has happened, but

you're not quite sure what. Six feet of concentrated activity is tearing through the water like a torpedo destroyer charged with electricity. Slap, dash, whizz—round he comes to the right; and before you have swung your chair about to follow him he has changed his mind like a flash and is back again on your left. Slap, dash, bangity-bang—he is trying to tear the rod out of your hand. Never jumping out of the water or boring deep down beneath it, this sea-tiger describes a series of intricate figures and bewildering curves a few feet from the surface; twisting and turning, turning and twisting, with one or two long rushes thrown in as a variation, that pull the rod top nearly into the water and leave you gasping with bewilderment: and so the breathless fight continues till his mad fury is spent.

Add to it all, the fact that the sea, when the queen-fish is in a humour to bite, is always clear and smooth, so that its burnished sides are plainly visible to the enchanted angler even many yards away; and you have a picture, poor indeed as compared with the mad bewildering reality; but at any rate some sort of a picture of what this queen of fish is like. From the accompanying photograph of the smaller of the pair caught * (48lbs.) the reader may easily judge of the possibilities of sport which a hundred-pounder would afford.

There are other fish on these banks to test the skill and powers of endurance of the enthusiast. Barracudas (*Sphyræna barracuda*) swarm in their dozens, and a barracuda will give as good sport as a pike, which it so very closely resembles. A good specimen will run to a length of six feet, and will weigh sixty pounds or over. They have just the same hungry and wicked look as their better known brethren in fresh water, and when in the mood will dash at anything moving. They also have the merit of being eatable, a fact not to be made light of when you are far away from a fishmonger. Then there are

* This fish may be seen mounted in the Fish Gallery of the Natural History Museum. No attempt has been made, however, to reproduce its true colouring,

amber jack (*Seriola dumerili*) and amber "fish" (*Seriola lalandi*). The last is a beautifully shaped fish with a lovely golden or amber-coloured gloss over its iridescent scales. It is met with fairly close in to the shore, and runs to weights of anything up to a hundred pounds, and a length of between four-and-a-half to five-and-a-half feet. Both these fish belong to the large group of "yellow tails." They are both very game, but the amber "fish" is much the handsomer of the two, and is considered by the islanders to be quite one of their most desirable productions, both from a sporting and a culinary point of view.

During our stay Sir Frederic Johnstone caught two of these prizes, weighing respectively twenty-six and thirty-two pounds.

All the above fish are caught by trailing a spinning bait (the side of any silvery-looking fish is a suitable one) rather near the surface, while the boat you are in is rowed at a moderate pace by your "guide." In our case the boats had all been specially built for Sir Frederic for tarpon-fishing by an Isle of Wight firm, and the "guides" took the form of sailors from the yacht.

There are fish, however, which habitually live nearer the bottom than the surface-frequenting examples which we have so far mentioned. Such were grouper (*Epinephelus morio*) and snappers (*Lutiana*). The former live right down among the rocks and are more acceptable for the pot than for the sport they give. As far as my recollection goes we did not get many snapper, but one day in fairly deep water Lady Wilton got hold of a monster. Kellaway, her sailor fisherman, had spotted this giant through the fish-glass. It was swimming slowly round and round a large rock at the bottom.

"Quivering in each nerve and fibre,
Clashing all his plates of armour,
Gleaming bright with all his war-paint,"

and seemed, to his notions, from its enormous proportions, to be the father of all fish.

So, warily, the line was paid out, and a tempting piece of bait dropped in the fish's tracks, while the boat was cleared for action.

“Take my bait!” cried Hiawatha,
Down into the depths beneath him.
“Take my bait, O sturgeon, Nahma!
Come up from below the water.
Let us see which is the stronger!”

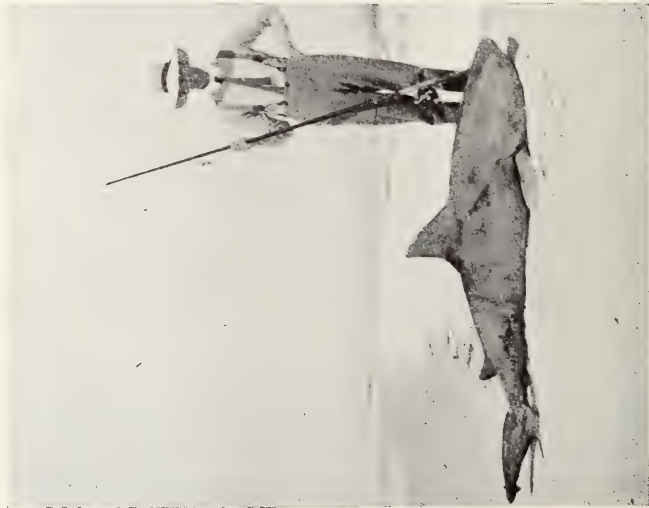
It was an exciting and a breathless moment as Kellaway, still watching through the glass and directing operations, saw the leviathan approach and fall a victim to the luscious morsel.

From this moment, for a good hour, it was a case of “pull devil, pull baker.” A very moderate estimate of its weight put it down as over eighty pounds and nearer a hundred, a prize indeed when one remembers that it was no lumbering jew-fish, but a bright red, well proportioned snapper.

Naturally, the first quarter of an hour or more of the fight consisted in trying to stop the fish boring down to the rocks and smashing the line. I believe this was the only occasion on which Lady Wilton ever allowed anyone to touch her rod once a fish had been hooked. But at the end of this first hard round, when the snapper's violent efforts to spoil sport had begun to relax a little, she was “all out,” and Kellaway was allowed to leave his seat and relieve the pressure on her forearms by supporting the rod with one hand. Then inch by inch, more and more line was slowly wound home, and the first danger of the rocks averted.

With the fish in mid-water, rush after rush still momentarily threatened disaster on the bottom; but the crisis of the fight had been weathered, and yard by yard the boat was now edged away inshore for a spot where the water was shallow and the bottom all sand.

Here in the clear water the huge proportions of the fish could be clearly made out and fully realized. Curiously



SHARK REFERRED TO IN TEXT: NO. 1, ON BEACH. NO. 2, BEING HAULED ON BOARD THE YACHT.
 NOTE.—The large hook seen in the right-hand illustration was used to tow the fish to the yacht.
[To face page 75,

enough as the fight went on and the fish's struggles began to wane, it was followed by quantities of smaller ones of rainbow hues. They seemed to have gathered from far and near to rejoice over the last moments of their giant tyrant and witness his last dying efforts: and then—Oh! hideous moment—just as the gaff was being made ready, up went the bent rod-top; there was that sickening, awful sensation of the negation of resistance, when the overwrought muscles of the forearm realize that they are straining against nothing; the line and trace fell limp and useless upon the water: *and the hook had drawn.*

Sharks, as we have more than once said before, were very numerous upon the banks; although we never saw any of very large proportions. Moderate sized ones are very active and make violent rushes when first hooked, so that they are by no means to be despised from a fishing point of view. I once caught one in Florida waters, with a tarpon-rod and a No. 22 cuttyhank line, which weighed 373lbs. To weigh it we had to haul it on board the yacht and cut it into convenient portions. Anything over this weight means more work than fun. Indeed, before I got this one ashore I was beginning to have grave misgivings on this very point. When we were anchored on the southern side of Swan Island the captain and the boatswain used to take a boat, anchor it, and fish about two miles out. Here, moderate sized sharks seemed to swarm, and were a great nuisance, swimming constantly round the boat and repeatedly coming so close that it required the frequent use of an oar to keep them at arm's length. One was so friendly that the boatswain hit it across the head with the boat-stretcher; and even this greeting had to be repeated before the brute realized that its company was not enjoyed.

Large tarpon have been seen and caught by the islanders on the banks. We never saw so much as a glimpse of one; but the fact seems worth mentioning as bearing on the manner in which these mighty fish wander at times about the open sea.

One day, while we were anchored off the little bay on the southern side of the island a devil-fish was seen making its way in from the open sea, along the top of the water, towards the shore. It seemed to be heading straight for the opening in the reef, and its arrival caused nearly as much excitement and interest as the advent of a rich "prize" must have done to the old time buccaneers.

All sorts of wildly improbable tales have found their way into print in regard to this weird-looking fish. It seems to have inspired the greatest dread in the minds of ignorant fishermen; and to have provided a convenient theme on which old-time travellers could really "let themselves go." The deeds with which it has been credited fairly make one's hair stand on end. The mildest of these seems to have been that in the case of pearl divers, it would hover over and cover a man at the bottom like a blanket, prevent him from rising, and so, of course, drown him. This belief seems to have been of very ancient origin; and among the fishermen and the pearl divers of Central America and western Mexico, the devil-fish is known as the "manta," a Spanish word which signifies a blanket. Why the devil-fish should want to drown a man is difficult to understand, seeing that, as Mr. Theodore Gill * has already pointed out, its diet seems to be in an inverse ratio to its size; and it is in the highest degree improbable that it would, or could, eat the unfortunate diver even if it had succeeded in drowning him.

Like several other marine giants, of which the right whales and the gigantic basking shark furnish the best known examples, these huge devil-fish seem to live on minute crustaceans and such like small fry; and a man would run as little chance of being eaten by one of them as he would by a baleen whale or one of these sharks forty feet in length.

Again, one of the main missions of life which the devil fish has let himself in for, seems, if we are to believe the reports of fishermen, to be that of deliberately smashing

* Miscellaneous Collections, Smithsonian Institute, Vol. III., p. 155.



AUTHOR AND TARPON (119 LBS.).

[To face page 76.]

the cables of anchored fishing boats. So rooted is this belief that in certain localities where they abound, the fishermen invariably put down two anchors. Strongly running currents, and the possibility of these weighty fish being driven on to the cables thereby, seems a more probable explanation of the breakage. In such circumstances, it seems not altogether inconceivable, that a devil-fish drifting along with a strong current and falling foul of one of these cables might grip it with its horn-like anterior fins or caropteres, which it is said to use for grasping purposes. In such wise, if so disposed, it might be inclined to hang on and take a rest; or possibly do so with an idea of preventing itself being carried off a suitable feeding ground by the swishing tide. But a more probable explanation of their presence underneath the vessels is that they were there for the purpose of eating the barnacles with which their bottom would be studded.

In connection with these nefarious and spiteful instincts which have been attributed to the devil-fish—the reason for which it is more than a little difficult to understand—one John Lawson, who seems to have been a direct lineal descendant of Ananias, writing in 1714 in his “History of Carolina,” thus gravely delivers himself:—“The devil-fish has been known to weigh a ship’s anchor and run with the vessel a league or two, and bring her back against the tide to almost the same place.”

With such travellers’ tales running in our heads, it can easily be imagined that a certain pleasurable thrill of excitement was felt as we rushed for a harpoon, while a boat was quickly lowered to set off in pursuit of our strange visitor. To make a long story short, nothing of a very adventurous nature took place. As we came up with our chase, it was still swimming leisurely along on the surface; its huge side fins alternately struck the water in a lazy sort of undulating fashion, and it did not appear to take the slightest notice of the approaching boat. A well directed shot on the part of Mr. Eagle, the first officer, sent the harpoon firmly home, and at once caused the devil-fish

to dive : but there was very little excitement. If we had secretly hoped for some startling manœuvres on the part of the fish we were quickly disappointed. It simply towed us, without any fuss or splutter or violent antics, in whatever direction it liked. While Mr. Eagle and one of the sailors rowed hard against it, I held the thin harpoon line. Once or twice the fish made a half-hearted jump just clear of the water ; but for the most part it was like trying to row against a kedge anchor. The moment the boat gathered a little way the fish manipulated its fins so as to put on a most effective break. We tried to tow our prize towards the opening in the reef with the idea of beaching it, but this laudable plan it resolutely refused to have anything to do with. Aided by a moderate tide, it simply beat us by a sullen dogged persistence. In the end, another boat manned by two more sailors came to our assistance. A rope from the stern of this was made fast to the bow of our boat, and in this ignominious fashion the devil-fish was slowly towed ashore. Arrived there I took its measurements. It was twelve feet across from fin tip to fin tip, and six feet from the head to the base of its whip-like tail. It was, therefore, by no means a large one of its kind. Judging, however, only from this one, we should be inclined to doubt if devil-fish, unless very large indeed, would afford any sport when caught with a harpoon. Certainly we shall never kill another in a like fashion.

Referring to a devil-fish which measured fifteen feet in width, Dr. Gunther in his "Study of Fishes" says : "The capture of devil-fishes of such large size is attended with danger, as they not rarely attack and capsize the boat." In our opinion, a fish would have to be at least twenty feet across before it would be worth going for, or be at all dangerous. Of course if one of even twelve feet across, happened by accident to fall across the boat during one of its occasional leaps from the water it would be very awkward ; but so it would be if a hundred pound tarpon fell upon one's head.



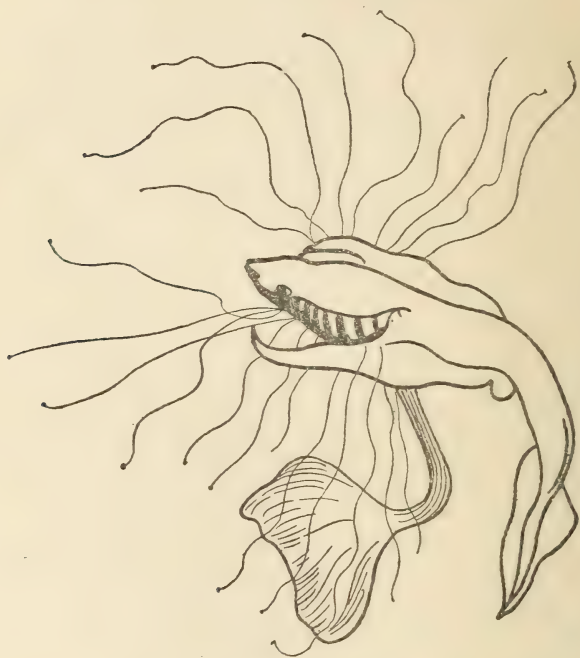
THE DEVIL-FISH CAUGHT AT SWAN ISLAND.

[To face page 78.]

This reference to the jumping capabilities of these fish reminds us of a tussle between a shark and a very large whip-ray, which we once saw going on in Boca Grande Pass, Florida. Suddenly, as we were being slowly rowed along, trolling for tarpon, there was a tremendous commotion just below the surface, and then a ray appeared, jumping repeatedly several feet clear of the water, and coming down each time with a resounding smack, which could be heard all over the Pass. At every fall the shark was at it again, and for a moment the two beasts seemed to be rolling over and over near the surface in a turmoil of foam and spray. What was the ultimate issue of this strange conflict we do not know; for after about half-a-dozen mighty springs on the part of the ray, both fish disappeared, and the calm surface of the water showed no trace of the giant struggle which had agitated it.

The devil-fishes are of course very closely related to these whip or sting-rays, as also to the skate family. A glance at the accompanying illustration of the specimen we killed on Swan Island will give the reader a better idea of the appearance of this fish than a page of wearisome description. We might, however, call attention to the short whip-like tail, to the mouth and gill clefts, which are situated on the under-surface of the animal, and to the peculiar horn-like anterior fins which project in front. There are also two interesting facts connected with the life-history of devil-fish and some other rays, which might come as a surprise to the reader not specially interested in this sort of questions. First, then, devil-fish, although fish in the strictest sense of the word, have young in almost the same manner as mammals—that is to say, they do not lay eggs like the vast majority of fish, but produce young which are at birth exact replicas of their mother. Secondly, although the superficial resemblance is so very unlike, they are by genealogy closely descended from and allied to the *Selachoides*, or sharks; or at any rate, both the sharks and these ray-

like selachians were descended from a common ancestor. The "parting of the ways," between the two lines of descendants, must have taken place at a very remote period of time ; for well-developed representatives of both the rays and the devil-fish families were living in the chalk period. But these devil-fish are no more like a shark now than a skate is. To discover "the secret of their birth," we must



EARLY SHARK-LIKE EMBRYO OF THE INDIAN BAT-RAY (*Pteroplatæa micrura*), TWICE NATURAL SIZE, AFTER ALCOCK.

have recourse, if we may be excused for an "Irishism," to a study of their structure before they were born. In other words, to embryology. Mr. Alcock in that most interesting book of his, "A Naturalist in Indian Seas," has given us a glimpse of their ancestry, as the result of his researches in connection with the short-tail bat-ray

(*Pteroplatea micrura*) and its embryo. He says : " The little embryo also revealed some secrets of its own genealogy. It was shaped, not like a skate, but more like a shark, having a shark's snout and a shark's tail : like a shark also, it had its *gill clefts placed on either side of its head* (italics ours—compare with photograph and remarks made about situation of gill-clefts in devil-fish), and not on the under-surface of its body as they are in all skates and rays. Unlike those of most sharks, however, were its pectoral fins ; for these, instead of standing out at right angles to the body, were produced to form a pair of flaps running forward with a slight twist, one on either side of the head."

" Could we have seen the embryo at a later stage, we should have found that these two flaps had fused with the head, so as to push the gill clefts down to the under-surface, and to produce the broad disc-like body characteristic of the skates and rays. There are some rays, such as the devil-fish (*Dicerobatis* and *Ceratophora*), in which the flap-like anterior prolongations of the pectoral fins are not entirely fused with the head, but stand out in front of it like a pair of horns ; these, judging from the form of the embryo of *Pteroplatea micrura*, may perhaps be regarded as ' unfinished ' rays."

Thus in these few lines we get a glimpse of the mode of origin of the curious horn-like fins seen in the devil-fish ; of how its gill clefts came to be where they are now, viz., on the under-surface of its body, instead of on the side of its head as in the sharks ; and of the natural affinity which it has to the shark tribe generally.

Why these devil-fish, as well as other rays, should produce young in such an unfish-like manner is a question which would be too difficult for us to answer. Only one baby devil-fish is born as the general rule, but twins have been recorded. From the moment of birth they are quite capable of looking after themselves, in which, of course, they differ from mammals, whose young have to be suckled.

But the "suckling" period, if we may use such a term, in the case of these rays, is got through prior to birth; just as in the case of certain nidifugous birds, the development of the plumage is pushed forward in the egg, so that when the chick is hatched it can run and fly and fend for itself (*cf. Megapodes*). This process of "suckling," which seems so suggestively to foreshadow, that which should be made perfected when mammals had begun their reign on earth, is so interesting, that perhaps I may be pardoned for again quoting Mr. Alcock (p. 210, *loc. cit.*).

"Among them was a large female sting-ray, over nine-and-a-half feet long. . . and lying unborn in her oviduct, I found a young one, three feet in length. The mucus membrane of the oviduct was shaggy, with vascular filaments dripping with milk, and on microscopic examination I found that each filament was provided with superficial muscles, whose contraction must serve to squeeze the milk out. Some such mechanism is undoubtedly necessary, seeing that the young one has no power of extracting the secretion for itself. On examination of the young one, the mother's milk was found inside the modified first pair of gill-clefts or spiracles (the other gill-clefts being tightly closed), and also in large clots within the spiral valve of the intestine, so that there can be no doubt that in these viviparous rays the unborn young one may be said to 'drink its mother's milk' like a mammal, even though the milk-like secretion does not go in at the mouth, but by channels homologous with the ear-drum of air-breathing vertebrates."

CHAPTER VIII.

"A YOUNG AND RISING" ISLAND.

BUCCANEERS, birds, and turtles were not the only subjects on which the "laird" held forth. One day, for instance, while we were sitting on the verandah, smoking and watching the sun gradually disappear on the other side of Yucatan, he began to talk about building a new bungalow. From this we went on to discuss the question of building material and the cost of transport, until at length the conversation touched bottom at flagstones.

Now any kind of "stone" on a coral island, except those which drift there by accident, entangled in the roots of trees, are, as anyone knows, as rare as strawberries at Christmas time. Therefore, when the "laird" volunteered the remark that among the natural productions of the island are flagstones, or great slabs of the hardest rock imaginable, I expressed a little incredulity, and suggested that possibly this "stone" might be simply coral rock which had been acted upon by rain and sun, and so rendered homogeneous and hard.

Whereupon, some one was sent for what took the place of the coal hammer on the island; and armed with this we sallied forth to the larder, at the threshold of which was laid a long oblong block of worked stone. It rang hard and tough, like a true flagstone would; and looked like one; not like the flat metal-ringing slabs of pure coral limestone one sees on an upraised sun-scorched reef.

"And now," said the laird, "I will shew you our quarry;" and from the larder we proceeded down to the beach at

the head of the bay : and here, for the first time in our life, we saw, at a certain spot, dame Nature engaged in the very act of making "stone." The beach here has a very gentle slope ; and just out of reach of the breaking waves, were long slabs of a stony rock similar to the larder doorstep. They ran at a very gentle angle inland ; and were presently covered by the sand of the beach, further up the slope, and by the debris and humus which had gone to make up the little plateau on which the bungalow was built. Twenty yards or more from the high-water mark, the hammer rebounded off the hard, smooth and uniform surface of the slabs, like a pea on a hot brick ; but as one gradually approached nearer and nearer to the water, so gradually the rock dipped and became softer and softer, until at last it was of such a consistence that one could push a walking stick through it. Finally, it became nothing more than a smooth, glistening surface of muddy-looking sand, which was planed and polished by every surge of the sea which came gliding up the slope.

So here it was, just between the limits of high and low water, that Nature was manufacturing "stone," or blocks of cement, in such an unusually rapid way ; mixing, blending and churning the ingredients of which it was composed, and finally spreading the plastic sludge along the gently sloping beach, where it received its final grinding, polishing and hardening. This mixing must have been carried out in certain very definite proportions ; for to all intents and purposes this portion of the beach was nothing more than a natural cement manufactory. As far as one could discover, the ingredients concerned were sea-water, calcium carbonate in solution, coral sand, and a peculiar marine clay-like deposit of an exceedingly fine and soft consistence, which appeared to underlie the whole of the western island.

This last deposit deserves special notice, for, as far as we are aware, nothing of quite a similar nature has been described from any of the West Indian Islands.

We must state that the whole of the western island is covered with a capping of coral limestone, which is more or less decomposed. We use the word "capping" advisedly; because in any part of the island, by sinking a hole of from roughly eight to fifteen feet, one comes upon this peculiar soft clay, which in outward appearance and behaviour is like nothing so much as *Fuller's earth*. There is, in fact, good reason to suppose that the deposit would serve the same purposes as this useful commodity, which, besides being used as a toilet powder, is also employed in bulk for refining crude mineral oils; and in old days was employed by fullers in extracting the excess of oil from the wool used by them in weaving cloth. When placed in water this Swan Island earth behaves exactly like fuller's earth; and the deposit left at the bottom of the vessel, when rubbed between the fingers, gives an impression of extreme softness. Short of actually trying it in practice, Mr. Allen Howe, of the Geological Survey, London, could see no difference between it and fuller's earth.

At various places along the east, west, and south coasts of the island, this interesting deposit can be seen cropping out in the exposed cliffs at sea-level or a little above it; and there can be little doubt that it extends outwards from underneath both islands as far as the limits of the outlying banks. In other words, Swan Island probably consists of an elevated "hogsback" of marine deposits, upon which reef-building corals had grown to form a capping, as soon as ever the submarine elevation had reached a level at which the life of reef-building corals was rendered possible.

In a low escarpment, facing the buccaneers' earth-works, at the east end of the western island, I noted one day the following strata: First, a layer of two or three feet of loam and soil, then from twelve to fifteen feet of coral limestone, more or less decomposed; beneath this a stratum of from three to four feet of a laminated red shale, and finally at the bottom of all, and commencing

a few feet above sea-level, the dry clay-like homogeneous deposit under discussion.

How deep the deposit extends it is of course impossible to state; but in sinking the foundations for a wireless telegraph installation, it was found to extend for at least twenty feet, and it may, of course, continue for a hundred or even far more.

The "laird" was considerably interested in this deposit; and was hoping to turn it to good account by shipping it to the States, where it might be used for the same purposes as fuller's earth, and so add very greatly to the value of his island. For our part, however, we were far more interested in the history of its origin and the light it might possibly shed upon the changes of level which had taken place in past geological ages in this part of the Caribbean Sea.

Our first thought, on viewing these deposits, was that here in this little island in the western Caribbean, we might have, on a small scale, a replica of the conditions which once obtained in the island of Barbados, when that island first thrust its head above sea-level after rising from the abysmal depths to which at one period it had been plunged. Curiously enough, we had visited Barbados six weeks or so before our arrival at Swan Island; and after reading Mr. Jukes Brown's interesting account of the geology of that island, had made a small expedition to the hilly "Scotland" district. Here we had seen, on Bissex Hill, those calcareous and siliceous earthy deposits—full of the dead skeletons of minute oceanic creatures, known as *Foraminifera* and *Radiolaria*, which prove, as fully as anything can be proved, that Barbados at one period of its formation was plunged (after its foundations had been laid down in shallow water adjacent to some high, mountainous land) to a depth of something between 12,000 to 18,000 feet or more beneath the sea. Now, as Mr. Jukes Brown states, "Radiolarian ooze does not exist in the Atlantic, but is found in the Pacific and Indian Oceans at depths of from 2,000 to 4,000 fathoms. Its

existence in Barbados therefore, suggests the idea that it was formed in a deep basin which was open to the Pacific as well as to the Atlantic, and consequently at a time when the Isthmus of Panama did not exist."

What, therefore, passed through my mind, as we gathered up a large bagful of these Swan Island deposits, taken from a boring, was this : would they be found on microscopical examination to contain some of these foraminiferal or radiolarian organisms which had lived ages ago, and whose skeletons had sunk to form an ooze at the bottom of this division of the Caribbean, at a time when there was no land connection between North and South America, and when, therefore, this part of the sea-bottom was overflowed by waters from the Pacific ?

On the other hand, the deposit might consist of some fine volcanic dust, which was not very likely ; or it might be a residual deposit left after the decomposition of a limestone, formed on the sea-bottom, out of the dead remains of coral organisms or other marine animals, living either upon or near the bottom, which when they die leave their calcareous frameworks to form vast deposits, the limestone rocks of future ages.

What made the first alternative a possibility, or even a probability, was the fact, to which we referred in Chapter VI., that we had found among the coral reefs surrounding the island some small fish which previously had never been found anywhere else but on the *Pacific* coast of the American continent ; which fish we may regard as having been cut off from their colleagues of the Pacific when Central America finally emerged from the bottom of the sea.

Dr. Andrews, F.R.S., and Mr. Mukler, of the British Museum, have very kindly examined the deposits for me, and found in it the following genera of *Foraminifera* : *Ammodiscus*, *Cristellaria*, *Globigerina*, *Lagena*, *Nodosaria*, *Orbulina*, *Polymorphina*, *Rotalia* and *Sphæroidina*. There were also some slight traces of diatoms and sponge spicules

and also other examples of *Foraminifera*, which could not be named.

All the genera mentioned above are common, and possibly shallow-water forms, and Dr. Andrews informs me that Mr. Mukler is inclined to regard them as fossil, but cannot determine their geological age. All that can therefore be said at present, is that the extremely soft and finely-divided earthy deposit, which underlies the coral capping on Swan Island, is a marine deposit containing the remains of certain *Foraminifera*. Nor is there any evidence, so far, to enable us to say at what geological age it was laid down and subsequently elevated.

With regard to the oceanic deposits of Barbados, Mr. Gregory* was inclined to consider them "as of comparatively recent date, either Pliocene or Pleistocene": but we have already seen that the presence of radiolarian ooze in these deposits is considered to be proof of the one-time presence of Pacific waters in this region, for no radiolarian ooze is found in the Atlantic. If, therefore, it is correct to say, as Dr. Gregory has himself stated† that the Atlantic and Pacific oceans have never been united since the *final* emergence of Central America in early Miocene, or possibly Oligocene times, the age allotted by him to the oceanic deposits of Barbados seems for this reason, to say nothing of others, far too late.

Mr. Spencer ‡ puts the age of these deposits as between that of the "Scotland" sand-stones of Barbados (deposited in Eocene times or before) and the white coral limestones which lie above them. These limestones he refers to the Oligocene period.

In Cuba there occur oceanic beds which appear to have been deposited during local depressions to abysmal depths in or before the Miocene period,§ and these oceanic beds contain *Radiolaria*. These deep-sea radiolarian

* Quart. Journ. Geol. Soc., Lond.

† Quart. Journ. Geol. Soc., 1895. Vol. LI., p. 255.

‡ Quart. Journ. Geol. Soc., 1902. Vol. LVIII., p. 357.

§ Bull. Geol. Soc. Amer., Spencer. Vol. VII., 1895, p. 94

oozes in Cuba have been correlated with the oceanic series of Barbados, and also with like deposits in Jamaica.

Whether similar radiolarian oozes would be found beneath the deposits already exposed on Swan Island is, of course, a matter of conjecture ; but it would not require a great effort of the imagination to picture the time when in future ages, Swan Island may be uplifted to much greater heights than its present level, and when a very similar series of rocks will have been exposed as obtains on Barbados at the present day.

Moreover, in this hypothetical upheaval, we can foresee the formation, on a smaller scale, of exactly the same series of coral terraces, derived from a sequence of fringing reefs, as has occurred on Barbados. It is rather curious also to note, as bearing on our comparison of the two islands, that just as in the process of upheaval which took place in Barbados, that island, at one period, consisted of two separate portions divided by a channel, at the bottom of which grew reef-building corals ; so we see exactly the same conditions in the twin nature of the two Swan Islands at the present day.

It is also interesting to note the occurrence of the red clay-like shales, which we have already referred to as occurring at the foot of the low escarpment at the east end of the western island ; for red clays are found in places in Barbados lying between the white oceanic earths and the coral capping.

CHAPTER IX.

HOW THE LAND PLANTS CAME TO SWAN ISLAND.

“What the sea sends and the land lends.”

To describe an isolated island, which has never had any connection with the mainland, without referring to its vegetation, or to the various agents by means of which that vegetation has arrived to clothe what would otherwise be a bare patch of coral debris, would be to ignore one of the most interesting problems connected with coral islands.

In this chapter, then, we shall briefly attempt to give the reader an idea of the woods which cover Swan Island ; and then as briefly refer to some of the probable ways by which some of their constituent trees and plants have arrived from distant lands to form its flora.

Originally, Swan Island must have been covered from end to end by one uniform forest growth. At the present day, what with the clearings made for crops by the present occupier, and the much more extensive workings at the eastern end made by phosphate diggers in years gone by, a good deal of the original wood has disappeared. Fortunately, however, there is still left far more woodland than clearing. These woods contain a varied assortment of goodly forest trees ; among which is the satin-wood tree (*Xanthoxylon*) ; dyewood or fustic (*Maclura tinctoria*), which was formerly used for dyeing, and also for turnery and cabinet making ; snake-wood (*Brosimum*), another extremely beautiful wood which takes a splendid finish,

and which, be it noted, sinks like a stone ; bitter plum (*Simaruba*) ; hog plum (*Spondias*) ; thatch palm (*Copernicia*), which grew everywhere, and was one of the most useful trees on the islands ; for besides making a very convenient thatch for roofs or walls of huts, the negro boys made hats, baskets, and even ropes out of it ; mastics (*Bursera*), of which more anon ; and many other species to which we could not pretend to put a name.

Many of these were quite tall trees ; and one of the first things that strikes one in regard to them is the total absence of damage done as the result of hurricanes. The islanders had never experienced one of these scourges, not even at the time of the bad one which caused such destruction in the Cayman Islands, Cuba and Jamaica, in the year 1903. Indeed the " laird " had come to the conclusion, from a twenty years' knowledge of the island, that it lay in a zone which was just missed by these terrifying vortices. To walk about the Grand Cayman, as we had done in 1904, and see on every hand dozens of trees lying prone, with their roots torn wholesale from the ground, was a violent contrast to the sight of these well-grown woods, in which one rarely comes across even a casual fallen tree. It may be that the trees on Swan Island have a better chance to secure a firmer hold in the soft decomposed limestone on which they grow, than the Grand Cayman Island trees, which have to contend against a substratum of coral limestone which is simply adamant : but it seems impossible to imagine a hurricane sweeping over Swan Island without doing an irreparable and obvious amount of harm.

Another thing one immediately noted in regard to the woods was the extraordinary number of spiders, of many different species, contained in them. Some of these spiders were brightly coloured and very beautiful ; others were characterised by various curiously projecting spines and knobs.

To me, one of the greatest charms that a small tropical island possesses, is the way in which the trees come right

down to the sea and actually throw their shade upon the very beach. They did so on Swan Island, and one could, at arm's length as it were, observe the very fighting line between the sea and the forest. In five yards one could step from the painful eye-aching glare of the beach into the dull green gloom of the woods. And here, one is obliged to own it, the first things you missed were flowers. Even orchids were conspicuous by their absence in the shade of these Swan Island woods, which struck us as being peculiar, for in the Cayman Islands they are extremely abundant. In Little Cayman, almost every tree seems laden with them; while on Grand Cayman there is one (*Schomburghia thompsoniana*) which is found nowhere else.

On Swan Island, almost the only patches of colour in the original woods, were the many gaily-decked fungi (rather a curious fact seeing how dry the woods were); and a large and brilliant land-crab. This land-crab was rather an awesome looking beast. His carapace was nearly black above, but a bright and splendid purple beneath; while his walking legs were deep sealing-wax red, and his claws or chelipeds ivory-white, each "pincer" being of equal size and much elongated. When you went near this crab he would positively run at you; then sit up on his hind legs, display his beautiful purple "stomacher" and frantically wave his ghostly-white claws. His chosen abiding place was in the green glimmer of the woods on the north side of the island, where he seemed to have constituted himself a sort of ogre of a particularly creepy and shuddery kind.

In regard to the conspicuous lack of floral display on Swan Island, it is worth noting that two birds which take a very prominent part in the West Indies and elsewhere in the polination of flowers are not found here. These two birds are the honey-creeper (*Cæreba*) and the humming-bird. I mention them because of the undoubted effects which birds, as well as insects, are known to exercise on vegetation and vice versa.

I do not wish to lay much stress on the fact, but I have noticed in other islands that honey-creepers are extremely fond of frequenting logwood bushes (*Hæmatoxylon*) and trees of the mimosa and cæsalpinia order and that the fore-parts of the head of these birds are often smothered with yellow pollen. Logwood is certainly not found in Swan Island, and if any species of mimosa or cæsalpinia were present they did not attract my notice.

The absence of two other trees on Swan Island is a little interesting; because both are found in the Caymans. These two trees are the mahogany tree and the "cedar" tree (*Cedrela odorata*), of which cigar boxes are made. Of other trees and plants which are present, in addition to the ones which we have already mentioned, there was a small shrub-like plant which impressed itself on our notice more than any other. This was *Phyllanthus speciosus* * (*Xylophylla*) a plant which grew about breast-high and formed a conspicuous part of the undergrowth, which otherwise was very scanty. *Phyllanthus* belongs to the wide-spread family of *Euphorbiaceæ* and is peculiar in being leafless. What one takes at first sight for leaves are really only flattened out and leaflike stems (*cladodes*). These false leaves are lance-shaped and rather leathery looking (the plant being an obvious xerophyte, or one accustomed to dry stations) and round their thin edges are arranged the minute pinkish-red flowers, either male or female, very much after the style of the flowers which are seen on the edges of the leaves of the butcher's broom (*Ruscus androgynus*) which is found in the Canary Islands. The real leaves of *phyllanthus* exist as minute scales. It is interesting to note that according to Griseback, *P. speciosus* is in Jamaica a *mountain* species. It probably got itself conveyed to Swan Island by means of the wind. Other species, of the same sub-group (*Xylophylla*) to which *P. speciosus* belongs, are found in Jamaica on rocks, in

*Kindly identified for me by Dr. Rendle of the South Kensington Museum from specimens which I collected.

elevated rocky woods, or on the sandy sea shore, all dry localities which harmonize with the conditions found on Swan Island.

Another very striking feature of the woods was the extraordinary number of "wild figs" (*Ficus*). The day on which the first seed of this vegetable fiend got itself transferred to Swan Island spelt death to hundreds of vigorous and healthy trees. A shiver of apprehension may well have permeated every living tree when the first news of its arrival was wafted through the forest. To walk through some parts of these island woods is to be brought face to face at almost every few yards with a cruel tragedy. There is really very little exaggeration in this; for the subtle tactics pursued by this vegetable murderer are little short of horrible, so fiendishly clever is it in working for its own ends. As one stops in front of a fine young forest tree and observes its ghastly struggle for dear life, one feels positively sorry for it. To make a long story short, the "fig," instead of starting on the lowest rung of the ladder of life, starts half way up it. To do it, it has of course to be subservient to some high-born or influential agent higher in the social scale than itself—in this case a bird—to give it its first "leg up." At a height of some ten or more feet from the ground, the bird one day drops a seed of the "fig" in the fork of a healthy young tree. As soon as the seed germinates it puts forth, like all other seeds, roots; but instead of these roots* piercing the bark of the tree like a true parasite, they grow downwards in the air, swaying to and fro in the slightest puff of wind in a way that suggests snakes. Rapidly increasing in length and thickness, these air-roots eventually reach and take root in the ground, close to the base of the trunk of the wretched tree which has received its unwelcome guest. From this moment the fate of the tree is sealed; and its lot grows daily more melancholy

*A few true ground-roots grope about for nourishment in the decaying humus formed from leaves which have lodged in the fork of the tree.

and hopeless. Sap now begins to course freely up the air-roots, carrying nourishment from the ground to the leaves of the interloper above. As these grow upwards as a small sapling tree, more and more sap is required; the air-roots, which are no longer air-roots but ground-roots, increase in girth; they send out lateral connections to join their fellows, till soon the trunk is enclosed in a sort of living net work or trellis. In this hydra-like vice it is gripped and squeezed and deprived of its proper share of nourishment—throttled and starved, slowly but surely, to death. The higher and more tree-like grows the young upstart epiphyte from its aerial platform, the more woe-begone becomes its miserable victim; until at last its branches wither and die, its trunk decays and rots away, and nothing is left of it but an empty pathetic husk reminding one of the juiceless body of a fly in the arms of a spider.

It would be tedious to go on troubling the general reader with a mere inventory of the botanical contents of the island; for already he may be asking himself, why bore us with a catalogue of trees and plants, which we have never seen and are never likely to come across? But we would crave a few more lines of indulgence, for all these plants are but mere pegs whereon to hang a tale. And so we will merely mention such common objects of the tropical sea-shore as manchineel (*Hippomanes*), sea-grape (*Coccoloba*), various kinds of “mangrove,” the convolvulus-like *Ipomœa*, a trailing runner of which we once gathered, accurately measured, and found to be one hundred and seventy-three feet long, *Guilandina* (the nicker-nut bean); the seeds of which are sometimes washed up on the coast of Norway after travelling right across the Atlantic, and, of course, the ubiquitous cocoanut palm (some of which the “laird” was convinced had floated here and seeded themselves); while lastly we must refer to the profuse way in which the “West Indian birch,” or Indian skin (*Bursera gumniifera*) was distributed.

This tree had a habit on Swan Island, very rare among tropical trees, of growing in big groups or clumps. There were, for instance, one or two places in the woods where they grew so thickly together that one might easily have thought they had been planted by human agency. Except that the bark is of a bright mahogany-brown, and is very smooth (hence the term "Indian skin") these groups reminded us of plantations of young silver birch, an effect enhanced by the numbers of little wood-warblers which used to frequent them, and which seemed, to our fancy to take the place of the tits one so often sees among birches at home. Possibly these "West Indian birches" represented a secondary growth which had sprung up on land previously cleared of original wood; but it would be interesting to know the exact causes which had enabled them alone to establish themselves over such large areas to the exclusion of every other kind of tree. Practically nothing grew beneath them but the *Phyllanthus*.

* * * * *

All these plants and trees are examples of true natives, which have found their way at one time or another, in the distant past, to this island by purely natural means. In the remnants of the ancestral woods you may see the final results of an incessant struggle for place, position, and station, amongst a host of such-like vegetable colonists which have striven to assert themselves, and have either won or lost, or established a compromise—a *modus vivendi*—in a racial war. You see, in fact, the well-balanced, more or less stable, result as natural selection and other of Nature's forces have ordered it, up-to-date.

But the moment you step out of the woods into a clearing, or on to one of the many grassy roads, which have been cut through the woods from one point of the island to another, you come upon another class of strugglers and fighters. Many of these are obviously pure interlopers, which got an accidental footing on the island through the agency of man. But there are many others—real natives—which had simply been biding their time, wait-



THE HERON POND.

[*To face page 97.*]

ing for their chance, for room and light and sun, and with the felling of the forest trees had eagerly grasped it. Young cocoanut trees, planted out with mathematical precision, were being strangled and crowded by a jostling throng of these last poor plants, which had never had such a chance for ages. It was as much as the islanders could do to keep them down and give their crops elbow room and breathing space.

Again, the sun-bathed edges of the wide belts of forest, which had been left to form a protection from the winds round every clearing, were simply groaning with a tangled mass of creepers which one did not see in the old-time woods. Vast curtains of blue convolvulus made great splashes of colour upon these dull-green tapestries which hung pendant from above.

And birds too, as we have already seen, had even found their way to these clearings from distant islands; and flew about in flocks, in a locality where up till quite recent times they had been utter strangers.

But the plants which have been accidentally introduced by man, and the birds which chance winds have lately blown here, are of little interest when compared with the problems of the real indigenous flora of these little islands. It is a thousand pities some one does not go to Swan Island and make a catalogue of *all* the native plants and trees, before they disappear beneath the onslaught of foreign interlopers and the rude effects of man's occupation. Looking back now, we exceedingly regret that we did not make collections and more notes of this indigenous flora. One does not want to be a full-fledged botanist to be able to appreciate the immense interest of it.

For we must recollect that for every kind of plant on Swan Island, from the great satin-wood tree with its spreading branches and massive trunk to the water-weeds in or around the one pond of fresh water, or to the humble fungus in the woods; there is the fascinating problem to be solved, to be conjectured upon, to be pondered over,

—how, *exactly how*, did it arrive? And having once arrived, how did it establish itself?

We shall hope to prove later that Swan Island (as it is to-day) has never had any dry-land communications with the mainland, and might in fact be very well called a pseudo-oceanic island.* Therefore everything in the nature of its flora, not accidentally introduced by man, obtained originally a footing through the agency of birds, sea-currents, or winds. I put them in their order of importance, as they seem to me to have affected Swan Island. These means of the dispersal of plant-life are now too well known to dwell upon. But it would appear, that it is not all just quite so easy as we have been accustomed in this light to regard it.

One has thought, for instance, of the seeds of plants or trees floating for indefinite times, until chance washed them up upon the shores of islands such as these, and then—"well, of course, there you are, you know—the thing grows." However, according to the recent statements of Mr. Wood-Jones in his "Corals and Atolls," this seems far from being the case. In the great majority of instances, at the moment when success appears to be within the very grasp of the enterprising seed, something seems to be wanting; the process breaks down. Here is what Mr. Wood-Jones says. He is writing of the Cocos Keeling atoll: "Concerning those plants the seeds of which are hard and fitted for a sea journey, some very interesting points are to be noted. On the island beaches, are many kinds of seeds which may be picked up any day—there are perhaps half-a-dozen kinds, of which one specimen could be found almost with certainty in a walk along a hundred yards of beach. Now, these seeds will grow with great readiness when picked up and planted in the earth, but as their leaves become recognisable,

* At six miles due south of the islands the soundings show a depth of 1,053 fathoms. Fourteen miles due north 3,010 fathoms are recorded, while at thirty-seven miles in a south-westerly direction 2,350 fathoms are reached, and at fifty miles in an easterly direction they show 3,206 fathoms.—*Admiralty Chart*, 1877.

you are at once astonished to see *that they are of a kind of which no representative may be found in all the atoll*" (*italics ours*).

"It is a strange chapter in Nature's story, for these seeds have been arriving at the atoll from time immemorial; they have been cast on to its beaches by the waves, all ready to grow, but unable to take root in the broken coral that composes the beaches. A link in the chain is missing; for there is no bird or beast that will move them the very short distance to the resting-place, where they could turn centuries of failure into a successful colonising enterprise."

A most interesting instance of the truth of these statements is mentioned by Mr. Geo. Hirst in his "Notes on the History of the Cayman Islands," but apropos of another subject. It appears that a Mrs. Webster, of Frank Sound, about the year 1846, found on the beach, washed up by the tide, a seed, "the likes of which she had never previously seen." This seed was planted. It sprouted and grew into a tree, and the tree was found to be an almond tree, of which species there was not a single other example on the island. Mr. Commissioner Hirst states that all the almond trees now growing on Grand Cayman are descended from this one seed.

Again, one has only to read Mr. Guppy's "Observations of a Naturalist in the Pacific" to become impressed with the idea (right or wrong) that after all, the colonization of plants in tropical islands through the agency of floating seeds is confined to a comparatively very limited number of species, and to a very narrow zone of territory extending along the shore. Moreover, in these shore belts, there is a sort of floral currency, which, to a great extent, passes muster all the tropical world over. Thus, for instance, one may easily recognize thereon, perhaps a dozen or more trees and plants which may be seen on almost any tropical beach in whatsoever ocean. These floral navigators have hardly ever succeeded in pushing their advantage

home after having once established themselves on the beach and played their pioneering part.

It is true that in some instances, in the islands Mr. Guppy writes of, certain species have crept inland along paths which conform to the arid conditions of the beach ; or again certain genera possess both inland and littoral representatives, or the original littoral ancestor may have long since perished in the struggle for existence, leaving its inland descendants with no record wherewith to trace their descent or explain their presence on the island : but in the main, as Mr. Guppy points out, the beach and inland floras have been developed on independent lines, and “ in only a seventh of the whole beach flora can any question of a connection between coast and inland species of the same genera be raised.”

From all which considerations and without entering into more details, we may, perhaps, take it for granted that the majority of the trees and plants to be met with in the woods of Swan Island have not got there by the aid of floating seeds, in spite of the fact that Swan Island is so narrow that the whole of it might be regarded as littoral.

The influence of wind, which is such an important agent in the transport of Alpine species to high mountainous islands, and in the conveyance of the spores of ferns and other humble plant colonists, can almost be ignored in the case of our little islands—if we except such plants as the *Phyllanthus*, the fungi, lichens and grasses, etc. Therefore we are left with the inference that practically the major portion of the flora owes its existence to the unconscious efforts of birds.*

One could, of course, easily picture the time when, after a period when Swan Island first existed as a flat reef almost awash—the home of flamingoes, herons, frigate-birds, gannets, and waders—the seeds of *littoral* plants drifted to it, established themselves, and formed

* Even the seeds of the hog plum (*spondias*) which are capable of floating for an indefinite time, and which are constantly found washed up on the shores of Jamaica, do not, according to Guppy, gain a footing by means of marine currents.

the only members of its vegetable population. At this time there may have been at its eastern end, as the configuration of the land seems to indicate, a large and shallow lagoon round the margins of which might have grown such shore plants as various species of "mangrove," samphire, salt wort (*Salicornia*), sedges, sesuvium, bay-cedar (*Suriana*), sea-lavender (*Tournefortia*), and swamp-fern (*Chenopodium*); or growing along its arid fringes of coral sand, such plants as the prickly podded *Cæsalpinia bonducella* (nicker nuts), the sea-grape bush (*Coccoloba*), or the long trailing convolvulus (*Ipomœa pes capræ*), which does so much to bind the sand and prevent it being blown to the four corners of the earth.

But all these were merely fascinating pioneers and land reclaimers, whose day has long been over, and which have long since been elbowed out of existence, as factors which count, although one can still come across them dotted here and there in odd corners and unclaimed fringes of the island.

Yet these "early discoverers," and salt-bitten, sea-faring plants* played as great a part in their day as the old-time human adventurers of the middle ages. They smoothed the way for colonists to come after, and clothed the jumble of coral blocks and the sandy coral debris of this reef-like island with its first green coat of vegetation. Out in the open sea, born of the depths of the sea, and raised but little above the waves, this bare reef became, through their efforts, a little green oasis in the midst of the blue expanse of water. And land birds flying from colder regions up north to winter in Central or South America, or vice versa, spied it from afar and recognised it as a temporary or permanent resting-place for their feet. We know what would have followed from the researches of Darwin, Schimper, Kerner, and many others. The land birds,† by all the now well known means, would have

* The seeds of *sesuvium* cannot float, and so must have been introduced by birds or wind.

† The seeds of plants have been found in the stomachs of such sea-birds as the frigate-bird, booby and petrel.

unconsciously distributed the seeds of land plants, which had become attached to their plumage, or in the case of waterfowl to their feet, or which had passed through their alimentary system undigested. Various species of duck * and waterfowl habitually visit Swan Island during the migratory season at the present day, so that there is no cause to work upon our imagination in regard to them.

Pigeons, too, not to mention other seed-eating birds, form a conspicuous feature of the bird population of the island ; and, as is well known, pigeons have probably played as great a part in the dispersal of island floras as any birds which we know of. We may refer here to the very curious fact that the little West Indian ground-dove (*Chamæpelea*) is not found on Swan Island, for as far as our personal experience goes, this bird is found, without exception, in all the other islands, big or small, in the Caribbean basin. Still, although it is not present now, it may well have been blown here by adverse winds in the early days of the floral colonization of the island, and have played its part before a uniform and thick growth of forest trees had rendered its existence on the island an impossibility.

And in any case it is just these little accidents or anomalies of distribution, which we may feel certain exercised an appreciable effect on the vegetation, and the absence or presence of certain species of plants. It is, indeed, no exaggeration to say that the mere "accidental" presence, or the mere "accidental" absence, of these small seed-eating, ground-feeding doves, may have been answerable for shaping the entire vegetative aspect of the woods of Swan Island. That is to say, it is quite conceivable. If it were not so there would be no interest in trying to unravel the threads of the fascinating puzzle presented by any and every insular flora.

So the seeds, brought by all these land-birds, by many a fortuitous chance, germinated, grew, reproduced themselves, struggled gamely against adverse circumstances,

*The islanders once shot 41 canvas-backs in a week.

and either won or lost as the case might be. Those that won and firmly established themselves were the fore-runners of a "movement" which was to revolutionize the existing flora of the island and make it eventually what it is to-day. We need not doubt it—these early land-plants put up an interesting and gallant fight. Even if we exclude the original strand flora, they had many enemies.

We are not aware if their influence has ever been noted before by botanists, but we should imagine that the iguanas which now exist in such numbers on Swan Island must have been among the chief of these enemies. These large lizards, of strictly vegetarian principles, had drifted to the reef across miles of open sea, taking unconscious advantage of floating trees or floating masses of vegetation, which had been detached from other distant lands or islands, as for instance Jamaica. Doubtless they thoroughly enjoyed the young, succulent, and sprouting leaves of the new plant colonists. Probably, too, they had their predilections, and selected the young plants of those species which specially appealed to them, such for instance as possibly the *Leguminosæ*, thereby exercising a selective influence on the early vegetation of the islands. Shore crabs, too, would soon have invaded the sandy shores of this new-born scrap of land; and since Mr. Guppy tells us (loc. cit., p. 190) that they nibble off the shoots of germinating seeds on the Cocos Keeling atoll; it is not difficult to imagine that they would soon have made their presence felt here in determining what was to be successful or otherwise in obtaining a footing on the island.

Lastly, among likely, or obvious enemies, which we can call to recollection,* would come a strange race of vegetarian rats (*Capromys*), tree-dwellers or tree-climbers, and now almost extinct on other islands in the West Indies, but which found their way across the sea to Swan Island in the same fashion as the iguana, and there founded a specific race of their own.

*We ignore the lamentable influence of goats, which could have played no part in the early floral colonization of the islands.

The effect produced by all three agents, to say nothing of others more intimately connected with the plants themselves, would be much more far reaching than we should be inclined to suspect at first sight, especially as regards the *kind* of plant which survived. Yet in spite of all, the land plants won through.

The sea had sent them a new inheritance, born of the water, conceived in the depths of the water. The birds of the air had brought them. The land had lent them. Surely, if we had an inventory of every kind of plant on the island; if we could follow back the threads of each one's history of successful struggle and inventiveness, which accounts for its presence on the island to-day, we should have an interesting and absorbing romance.

CHAPTER X.

LITTLE SWAN ISLAND.

LITTLE Swan Island, which we have so far entirely ignored, lies to the east of Swan Island the greater, the two being separated by a shallow strip of water less than a quarter of a mile across.

Although so close together, the two islands are superficially not at all alike. Little Swan Island rises abruptly from the sea like a big bluff about a mile and a quarter long. Except at its north-west corner, the low cliffs which form its sides fall almost perpendicularly to the sea. Like the larger island, it lies due east and west; but whereas on the southern side, the water is fairly deep right up to the base of the perpendicular cliffs, without a hint of any fringing or outlying reef; on the northern side the water is much shallower and full of sunken reefs. Moreover, this northern side, although higher, is not so perpendicular as the southern, and is strewn at its base with a jumble of massive fragments of rock. The plateau formed by the top of the island is densely overgrown with trees and bushes, which form a closely matted dome of vegetation above its wind-swept surface. This island has never been inhabited; and the only thing which could possibly induce any sort of commercial enterprise upon it—a deposit of phosphates at its eastern end—has never been worked.

During our three weeks' stay we visited Little Swan Island several times, being attracted by its entirely undisturbed condition; but on each occasion had to choose a calm day, for if there is any swell at all it is very

difficult to land without running the risk of smashing up the boat in which one goes ashore. One of the launches used to tow us up to the south side of the island, and then wait for the boat, while we scrambled ashore as best we could. As soon as this was safely accomplished, a little piece of cliff work had to be faced, during which process the guns, collecting bags, and whatever gear we were carrying, were hauled up from hand to hand; and in such wise we literally hauled ourselves up the jagged coral rock and so gained the top of the island.

Unfortunately, the moment you have congratulated yourself on the accomplishment of this preliminary piece of work, you find your troubles have only just begun. The cliff where we used to land was bad enough, studded as it was with thorny cactus, prickly bushes and creepers; but it was a mere luxury compared with the horribly jagged surface of coral limestone which you have to scramble over, once you are fairly started on your explorations.

To make matters worse, this boot-destroying, leg-breaking surface is densely overgrown for some way in with low "white mangrove" bushes (? *Laguncularia* ? *Conocarpus*), struggling to grow in what must have been for them very arid and rocky conditions; and through the short upright stems of which you have to thread your way with bent back and perspiring body.

This sort of thing continues for long enough to make you wonder if "the game is worth the candle;" and then you suddenly find yourself in the middle stretches of the island, where the surface is seamed and channelled with long and deep chasms running east and west. Some of these we could stride across, others we could not nearly jump across, some are three, some six, and others ten feet deep. The walls of these troughs are nearly always perpendicular, or at least that part of them which is visible; for the chasms have been filled to various levels with vegetable mould, which has been formed by the constant dropping of leaves from the low forest trees which every-



LITTLE SWAN ISLAND—DESCENDING THE CLIFF TO OUR LANDING PLACE.

[To face page 106.

where form a thick canopy above them. The ridges between them are more or less flat-topped but desperately bare and jagged; so that wherever possible we were glad to jump down and walk along the bottom of the troughs.

Little Swan Island is, in fact, a big "stack" of solid coral limestone which has been thrust bodily up from the sea bottom. Its homogeneous coral rock does not exhibit any very obvious traces of the coral organisms which originally were answerable for it, such, for instance, as one sees so beautifully in the series of raised terraces on the Island of Barbados. The rock, wherever it is not covered with soil, is so hard that it rings like iron. If you look over the tops of the cliffs which fall plumb to the sea on the southern side, they seem one solid uniform wall of finely-grained rock, chiselled and grooved and hollowed out, in those places where it is softer than others, by the fretful restless waves beneath. At the level of the water-line, and some little way down from this into the clear depths at the base of the cliffs, the rock has not suffered so much from the weathering influences of wind, rain and thudding waves; but it is polished and pink from an encrusting coating of nullipores (*Lithothamnion*) which have been worn smooth by the constant rise and fall of the water.

Returning to the curious channels with which the western end of the island is seamed: it was not difficult to picture the time when through them sluiced quickly-running currents of limpid sea-water, and when sea-fans grew in thick clusters on their bottom and chitons and long-spined sea-urchins clung to their water-worn sides. Now they are raised sixty feet above the sea, and the leaves from forest trees, the seeds of whose long dead ancestors were dropped here by storm-driven birds, have been falling and falling through the long ages and decomposing into the mould which threatens to obliterate all traces of them.

Had we been less inclined to take care of our boots, which, as a matter of fact, were horribly new and green,

we might have moralized over this outward and visible sign of the old coral "adam" being renewed in the form of the vegetable life above; since here we could almost see the coral reef that was, appearing in a new form of organic life, as the roots of the trees above us struck deep into its crevices: we could almost hear the sap—full of life-creating salts derived from these limestone relics of dead coral animals—coursing up to the sunlight, to the leaves and the expanded branches of the trees; there to be woven again into the mystery of revealed life: or we might have expressed our thoughts better by quoting Longfellow, where he poetically epitomises the theory of the conservation of energy in the lines—

"Nothing that is shall perish,
But perish only to revive again,
In other forms; as clouds restore in rain
The exhalations of the land and sea."

As you advance eastwards down the centre of the island, the going, in comparison with the rough work you have been through, becomes quite good: there is a more or less even surface of mould under your feet and a dense canopy of trees above your head. The furrows have disappeared, but their place is taken by several parallel terraces which are aligned along the length of the island. The walls of these terraces vary from about ten to fifteen feet high and are nearly perpendicular. You can get along quite easily here; for in spite of the huge spreading roots of trees and occasional massive blocks of half-buried rock, there is beneath the dense foliage of the tree-tops a curiously subdued greenish light, which has prevented much undergrowth.

Very soon after entering these shady glades for the first time, we were much puzzled by a curious chattering or muttering noise which came from above; and as nothing could be seen from below, it was a few minutes before we realized that we were walking beneath a nesting colony of frigate-birds. We had previously come across colonies of these splendid birds in the Testigos and the Los



FRIGATE-BIRDS AND THEIR NESTS.

[To face page 109

Hermanos Islands, and shall give an account of their nesting habits on the latter islands later on; but here the sites chosen for their nests were quite unlike anything we had seen before. They were large clumsy masses of sticks and grass, not supported and built up between the branching divisions of the trees as in the case, say, of a rook's nest; but simply laid upon the very tops of the trees, where they rested on the densely-matted surface of the leaves themselves.

After several attempts, we succeeded in finding a tree which we could climb; for we were anxious to get some photographs of these birds engaged in the work of incubating their eggs. One of the sailors followed up the tree, and between us, we managed to get ourselves and the kodak in such a position, that by standing on the very slender and swaying branches at the top, we could protrude our heads through the spreading canopy of leaves into the full glare of the sun.

We have often thought since, what an intense surprise this sudden apparition of our heads and shoulders must have been to these birds; for immediately in front of us and within a few feet on either side and behind us, were about a dozen pairs of frigate-birds with their nests. Some of these refused to move, apparently having no conception of the possible dangers of the situation; while others rose noisily and clumsily into the air, fanning our faces with the powerful strokes of their wings, six feet across.

We are not a good hand at photography at the best of times; but to stand with one's feet wedged in the forks of two swaying and somewhat frail branches, with both hands engaged on the camera, and with the positive knowledge that thirty feet below, there was an unpleasantly hard and jagged surface of coral-limestone to alight on, in case of a sudden upset, is not conducive to good work. We therefore offer but a slight apology for the photographs, which might no doubt be considerably better. They give but the faintest notion of the reality of the scene with which we were surrounded; for some

of these birds were within ten or twelve feet of us ; and to be suddenly introduced into the immediate family circle of such a private party is a thing which is bound to make an impression on the most phlegmatic ornithologist. These photographs may also be useful in comparing the nesting-sites chosen here with those used in Los Hermanos ; in the one case arboreal and in the other terrestrial or nearly so. For any further information as to the nesting ways of these birds we must refer the reader to the chapters alluded to above. There are one or two points, however, in regard to other peculiarities connected with this bird, which we might mention here.

On this island we came across three or four of their dead bodies, suspended by the neck from the forks of branches, at varying distances from the ground. They were gaunt spectres enough, but had become desiccated into perfect skeletons, to which many of the feathers still clung ; and unless one knew the reason for their presence, it might be wondered how on earth they came to be where they were ; for they were certainly never put there by man. It appeared that the islanders had noticed these corpses on the few occasions when they visited the island : and one of the negro " boys " most solemnly assured me that frigate-birds occasionally committed suicide, and that this was their method of taking leave of this wicked world. Why they should want to do so, was a point which apparently had not presented itself to the somewhat child-like brain of this simple black ; but the real explanation of the affair is simple enough. Exhibiting the most perfect powers of flight when once launched fairly into the air, the frigate-bird is a clumsy creature when he comes to earth. He loses his balance with surprising ease on the smaller branches of these unstable tree-tops, and in his ungainly efforts to regain it, sometimes tumbles through them in a heap. His great spread of wing is more than useless to him under these circumstances ; and he slithers down a helpless mass from branch to branch, till he eventually arrives on the ground beneath. Lucky

is it for him, if during his fall, his neck does not slide into some fork ; for the great weight of his body and his long bill make strangulation under these circumstances a certainty. As a matter of fact, even if he arrives safely on the ground, his troubles are not over ; for it is very nearly impossible for him to fly back through the dense canopy of branches above him ; and we can conceive that his only way of escape lies in quietly walking through the brush to the edge of the island, where he would find no hindrance to the use of his wings. During subsequent visits to this frigate-bird rookery, in climbing up to their nests we so frightened several birds that they actually did fall through the branches to the ground ; and so apparently helpless did they seem there, that unless we had caught them and carried them out to the open, there seemed every possibility that they could never have been able to extricate themselves.

I do not think it is generally known that frigate-birds are extremely fond of young turtles when they have first taken to the water and are unable to dive. Such, however, is the fact, and Mr. A. told me that these birds do such damage in this way to his turtle fishery, that he is obliged to have a yearly battue in order to keep the numbers of the frigate-birds under reasonable control.

It was also a distinct surprise to me to see one day a band of these birds drinking at a pond of fresh water ; for that I can only think is what they were doing. I watched them for some time hovering over this pond, and every now and then gracefully dipping down and apparently scooping up some water with their bills. Imagining that they might be feeding on some spawn or something in the shape of aquatic larvæ, I carefully examined the water, but could discover nothing, either on the surface or beneath it. Dr. A., the son of the owner, assured me that he had often seen frigate-birds doing this, and he was convinced that they were simply drinking.

Too much stress, I think, is often laid on the fact that frigate-birds live by chasing gannets, and making them

disgorge the fish they have caught, as in the case of the skua or robber-gull. They constantly do this; but they live a good deal on floating animal refuse, which they pick daintily off the surface. I have also seen them dive for fish near the surface; and once watched one chase and capture a fine flying fish in half a gale of wind. Several of them attempted to take Lady Wilton's spinning bait when she was trolling for queen-fish here, actually picking it up out of the water and sailing off with it and the line; a procedure which caused her ladyship considerable anguish "for fear that they should be hooked through the tongue."

I was told by the islanders, that if by any mischance a bird happens to find itself in the water it is very seldom able to rise again, unless there is a fresh breeze; and it sooner or later perishes. Considering the fact that these birds are provided with webbed feet, which at some stage in their evolution they must have made use of for swimming, this indeed does seem a very strange thing; but I believe it to be true. Certainly one has never seen these birds swimming. It would be interesting to ascertain if their young do. Mr. F. M. Chapman has remarked that the young of the common tern swim actively and with evident enjoyment; whereas, as is well known, the adult rarely alights on the water.

Another strange thing, considering their inimitable powers of flight, is the statement, vouched for by the islanders, that sometimes in very gusty weather they have seen a frigate-bird blown head over heels and fall helplessly into the water. They seem completely to lose their balance, or to be taken "flat aback" like a sailing ship in a sudden shift of wind. Whenever there was a strong wind, the frigate-birds, we noticed, always kept to the leeward side of the islands.

It was under the frigate-bird rookeries that we first made the acquaintance of the Swan Island rat. This rat is of an extremely mild and almost genial disposition; has a head and body very much after the style of an enor-

mous guinea-pig ; and is covered with rather long and silky hairs protruding through a thick fur. Its scientific name is *Capromys thoracatus* of True, and the species *thoracatus* is restricted to Swan Island. The genus *Capromys* to which it belongs is an interesting one ; for it comprises arboreal forms which are only found in the larger West Indian Islands such as Cuba and Jamaica, where it is in imminent danger of becoming extinct. It is just possible, therefore, that Little Swan Island will, in the future, represent the last stronghold of this peculiar and old time race of rats, for here they are left absolutely unmolested ; and no enemies, human or otherwise, seem likely to disturb them.

Scientifically, these rats are allied to the coypu (*Myopotamus*) of South America ; an animal attaining to a length of two feet, which lives in burrows near the water, and feeds on aquatic plants. How these rats came to find their way to Swan Island is a little point in the problem of the distribution of species which may be worth referring to ; for as we have seen, there is every reason to suppose that Swan Island has never had any connection with the mainland, and is of infinitely later date, geologically speaking, than the islands comprising the Greater Antilles, being of quite recent coral origin. Indeed, as far as its fauna is concerned, Swan Island might be looked upon as an oceanic or pseudo-oceanic island.* If, as seems most likely, this Swan Island race of rats was derived from the race which inhabits Jamaica (*C. melanurus*) the original progenitors of the Swan Island species must have drifted over a sea space of at least three hundred and twenty miles ; for Swan Island lies exactly that distance in an almost due westerly direction from the nearest point of Jamaica along the course of the Gulf Stream. The genus is not found on the mainland of Honduras, ninety-eight miles to the south, which puts this comparatively short sea-route out of court.

For the sake of those who may not have given such a subject a thought, we might add that a journey of this

* There are no snakes on Swan Island.

nature across an open sea could only have been rendered possible by the rats having been carried out to sea by means of a floating island of vegetation, or a mass of entangled tree-trunks such as one often sees in mangrove swamps.

The first Swan Island rat we saw was in the hands of Mr. Eagle, the first officer, who had just shot it. As he came up, holding it by its short tail, it looked for all the world like a half-grown rabbit. The second ran over some rocks in front of us, and tried to escape under the spreading roots of a large undermined tree. This, after a certain amount of caution, for we did not then know that these formidable-looking rats were surprisingly mild mannered, I caught by a hind leg, and drawing it carefully out, gradually enveloped it in my felt hat. From this it was transferred to a fishing creel, and we went on our way rejoicing.

These rats are diurnal in their habits; and we saw at least a dozen others running about and bolting into the big crevasses with which the island is seamed. We took several other specimens * and captured one more alive. One of these live specimens eventually arrived safely in England, and was in all probability the first example of the genus to do so.

I had the honour of exhibiting it one day, not only to his late Majesty, King Edward VII., but to his favourite dog "Cæsar." The rat exhibited not the faintest signs of fear or suspicion in the presence of the dog, or even of awe in the presence of His Majesty; and it seemed interesting to reflect, that if we exclude ourselves, "Cæsar" was the very first mammal, of any kind other than his own race, that the rat had ever set eyes on. While the dog was carefully held back, the rat came to the edge of the low table it was on, and putting its muzzle within an inch or two of the dog's, quietly inspected, what to it

* One of these measured $13\frac{1}{2}$ inches from tip of snout to base of tail, and $16\frac{1}{2}$ inches to end of tail. Owing to its massive hind-quarters and thick-set head the animal appears much larger than these measurements would suggest.



IGUANA, ABOUT FIVE FEET LONG—LITTLE SWAN ISLAND.

[*To face page 115.*]

must have been a most extraordinary and surprising apparition.

On the voyage home, and indeed from almost the first moment of their arrival on board the yacht, both rats made themselves thoroughly at home, and became great pets with the sailors. They were allowed to run about on deck, and would crawl over any one who happened to be lying down on the deck, without a suspicion of danger or fear. They both drank milk with avidity, and ate any form of vegetable or fruit that was offered them ; things which must have been uncommonly tasty after the deadly monotony of the diet they had been limited to on their little island. Unfortunately one of the rats died on its way home, and the other soon after its arrival in the Zoological Gardens in Regent's Park.

Little Swan Island simply swarms with iguanas, and like everything else, they were remarkably unsuspicious. One of them, about five feet from snout to tip of tail, was obliging enough to sit for its photograph in the most imperturbable manner ; although three of us had suddenly stumbled upon it as it was taking a siesta on a slab of rock.

It was almost comical to see the way in which some young, nearly full-grown gannets (*Sula sula*), were apparently fraternising with, or at least had got mixed up with, some iguanas which swarmed along the tops of the cliffs on the south side of the island. It was here that we came across a veritable happy family made up of iguanas and two species of gannet, viz., the red-footed gannet (*Sula piscator*) and the common booby (*S. sula*). There were old birds, down-covered nestlings, half-grown young, and practically full-grown young, which were just learning to fly ; while in many nests the adults were still busy incubating their eggs.

The red-footed gannets kept pretty well to themselves, and were nesting in some very large sea-grape bushes ; while the boobies shared with the iguanas a rough and rocky strip of ground, which extended between the edge

of the cliffs and the fringe of some wind-flattened trees, the commencement of the thick woods with which the island is covered. This extremely rough ground, overgrown with scraggy bushes or carpeted with mesembryanthemums (*Sesuvium*), was simply strewn with the nests of the boobies; while iguanas were perched on every available point of rock. The iguanas eyed us with a sort of supercilious stare, but did not offer to move until we had approached within a yard or so. Several times, by making a sudden dash at their tails the sailors caught these ferocious-looking, but perfectly harmless, lizards. Although supposed to be simple vegetarians, their presence here seemed a little suspicious; and we cannot help thinking that, as in the case of our vegetarian cranks at home, they helped themselves from time to time to an egg or two derived from the birds' nests.

The boobies, in contradistinction to the red-footed gannets, invariably nested on the ground, choosing as a rule a soft spot on the thick beds of sesuvium. Failing these, they made a foundation of dry sticks and covered them with sea-grape leaves.

Tame as all these animals, which we have so far mentioned, were, they were even beaten by the vitelline warbler (*Dendroica vitellina*), which on Little Swan Island seemed to surpass all limits, and to be quite fearless. In the low bushes, that we had to crawl under on first landing, they busied themselves in picking off insects within arm's length; totally unconcerned at our presence, and in marked contrast with the other non-indigenous warblers which also frequented the bushes.

There was another animal present along this southern terrace, very different in nature, and in the scale of life, from anything we have so far referred to. This was a minute grass-tick, or "Bete Rouge," which lived in its thousands in the grass and bushes and quickly transferred itself to our legs. I draw a veil over the habits of these disagreeable pests; merely saying that they cause the most intense irritation in one's skin, and render life



LITTLE SWAN ISLAND—BOOBY (*S. sula*) AND YOUNG IN NEST.
Note erection of feathers of neck and mantle in old bird.

[To face page 116.]

for a day or two a perfect misery. We owe them a deep grudge ; for on many occasions in South Mexico they have rendered the exploration of likely-looking bird-haunts a physical impossibility. We mention them from the interest they inspire from the point of view of how they came to have their origin on such an isolated island, and of how they can possibly manage to exist ; for the chance of getting a meal off an ornithologist, or the extremely few visitors to their island, seems such a rare event to look forward to in their lives that it can be assuredly ignored. Strangely enough, I saw no ticks on any of the rats, and none on the birds ; and certainly an iguana ought to be proof against their burrowing propensities.

CHAPTER XI.

HERMIT-CRABS.

THERE was another animal present on "Rat Island," as also on its larger neighbour, whose habits and evolutionary history interested us greatly. This was the hermit-crab (*Cenobita diogenes*), and it swarmed everywhere in its thousands. It was so common, indeed, that one day, when we wanted some bait to go fishing, two of the sailors, who had landed with bare feet, and so could not wander more than a few yards from the beach in search of them, filled a bucket, in less than no time, with these interesting land-crabs, which have become so strangely modified from the more ordinary type to suit the conditions under which they now exist.

This common West Indian hermit-crab belongs to a genus (*Cenobita*) in which is included all those hermit-crabs which have left the sea and taken to a life on shore ; but have not been able, like the robber-crab (*Birgus*), to dispense with some form of sea-shell, which they are accustomed to appropriate for the sake of sheltering and protecting their soft and fleshy abdominal parts. This flabby-looking portion of the body is covered with a soft flexible skin, strangely different from the hard chitinous investment seen in corresponding parts of other crustacea. It is spirally twisted to the right to correspond with the right-handed turns of an ordinary gasteropod shell.

Into this shell, which the crab either found empty, or from which it ejected the rightful mollusc owner, this

soft abdominal portion of its body is safely tucked away, and screened from prying eyes. Nor is it ever withdrawn, until the crab, finding its shelter too small for its requirements, voluntarily relaxes its hold; and having selected a more commodious dwelling-house, cannily proceeds to insert its hinder-parts into it and take up a fresh lease.

As in the true crabs (*Brachyura*), the first pair of legs belonging to *Cenobita* have been modified into big claws or chelipeds; but, contrary to what is seen in our familiar table friend, one of these has become enormously developed as compared with its fellow. Both claws are used for seizing food and breaking it up; but the larger one, in addition to serving the hermit-crab as a formidable means of offence, serves it also as a means of protection; for by first withdrawing the fore-part (*cephalo-thorax*) of its body, it can finally block up the mouth of the shell with this big claw and so can bid defiance and afford to laugh at its enemies outside.

These hermit-crabs on Swan Island ranged from mere brats to giant fellows which were living in the shells of a common gasteropod mollusc, the magpie trochus, called by scientists *Livona pica*. Woe betide the unfortunate individual who, in his zeal to procure bait, happened to have his fingers or thumb pinched by one of the big claws of these last grown-up members of the race; for they have a bulldog's tenacity of hold, combined with a crushing power which is extremely effective from the crab's point of view, but horribly painful for the bait procurer. A "tip" worth knowing in a predicament of this nature, is immediately to place the hand or finger, which has been seized, on the ground. The crab then instantly lets go. So long as you hold your hand up with the crab dangling in mid-air, it hangs on like grim death.

Mr. Borradaile ("Proceedings of the Zoological Society") says that the bodies of the hermit-crabs of this genus may be physiologically divided as regards their outward aspect into three regions: a fore-part, a mid-part, and a hind-part.

(1) The *fore-part* carries certain sensory structures, jaws and legs, by which the animal enters into relation with the outer world. It also contains the central nervous system and the stomach, both of which are intimately connected with the external organs indicated above. This is the only part which the animal habitually and completely extrudes from the shell.

(2) A *mid-part* which, when the fore-part is thrust out, fills the mouth of the shell. This part is provided with some modified limbs, which although helping the animal to retain a grasp of the shell, are quite subordinate in this respect as compared with the means to be presently described. This mid-region is an important one; for it carries the main breathing apparatus, which requires protection, and yet must be in free communication with the air. It also contains the heart.

(3) A *hind-part*, or abdomen, which contains a bulky liver and the organs of generation, and also in the case of the female, carries on its appendages the eggs; which thus obtain the shelter provided by the shell until the proper time arrives for their further development.

It is in this part of the body that we find an apparatus by means of which in normal circumstances the hermit-crab retains its hold upon its home. This apparatus has been evolved through a curious claw-like modification of the hindermost pair of abdominal appendages (pleopods), which are situated on the last abdominal segment of the animal. It may be regarded as a sort of anchor; and it is reinforced by a broad band of muscle (the cable of the anchor), which is situated along the ventral side of the abdomen. It serves exactly the same purpose as the columella muscle of the original maker of the shell, and serves it, we may add, remarkably well. You can pull as long and as hard as you like on the visible outside structures of the crab (always providing that you take care of that awful claw); but you will find that your efforts always result in pulling the animal in half and leaving the part desired still inside the shell, before this

hold gives way. Therefore, if you are a fisherman, and are looking for the nice piece of bait, which this succulent abdominal part so conveniently provides, you must, perforce, break the shell with a handy stone, or still more convenient hammer, before you can make it your own.

In the level parts of the centre of Little Swan Island these hermit-crabs were particularly numerous, and it was very curious to notice how, as one was tramping along, the concussion of one's footsteps was communicated to the crabs a few yards in advance. Instantly, on feeling it, they would stop crawling about; draw in the forepart of the body with all its appendages; stop up the mouth of the shell with their large hypertrophied "claw," roll over with the base of the shell pointing towards the ground; and like Brer Fox, lie low. In this position the shells simply look like so many discarded and empty homes strewn upon the ground; and where the crabs were particularly numerous, this sort of thing went on in front of one at every forward stride almost like clockwork.

On the bare ground, devoid of undergrowth, we constantly came across little parties of crabs which had collected close together in numbers up to about a dozen. These family parties were composed of crabs of all sizes. They looked like so many picnic parties, or perhaps solemn conclaves assembled to discuss affairs of state. They were often far from the shelter of tree-roots or fallen tree-trunks, under which they are fond of hiding; and what they were doing we could never discover, although we watched them to try and find out. One suggestion was, that the various members of the party had begun to find the shells in which they lived too small for their comfort, and that these meeting-places were like house agencies, in which an amicable, or the contrary, arrangement could be come to as to the expediency of "swopping" residences. There is one obvious objection to this theory, in that it inevitably leaves out in the cold the unhappy crab with the largest shell.

Cenobita diogenes is the only species of the genus which is found in the West Indian region. The family to which it belongs (*Cenobitidæ*) includes also the robber-crabs, (*Birgus*), and of the life-history of both very little appears to be known. Yet if we could follow up the threads of the evolution of either, we should surely have unfolded before us a most absorbing piece of history.

We have remarked before that these land hermit-crabs have left their old dominion in the depths of the sea, where the descendants of their infinitely ancient and long extinct marine ancestors still exist under a multiplicity of forms. As the result of dredging in the Gulf of Mexico and the Caribbean Sea,* including parts adjacent to these very islands, the staff of the "Blake" found thirty-eight species of marine hermit-crabs, of which thirty-three were new to science.

Some of these are not symmetrical like *C. diogenes*, but have a perfectly straight abdomen, and the proper number of appendages on both sides of it; while the shelters to which others have recourse in hiding their soft bodies are very varied. *Pylocheles*, for example, lodge themselves in holes of loose stones or in the central cavity of siliceous sponges. To render their lodging still more secure they hermetically close its orifice with their closely approximated claws, at the same time reinforcing these with the ends of their anterior walking legs. In *Xylopagurus*, again, the abdomen is quite straight. It lives in perforated pieces of wood, choosing straight chambers open at each end. Instead of entering backwards into its dwelling like our friend *diogenes*, this marine hermit-crab enters it directly, and then guards the anterior orifice with its large claw, and the posterior one with the sixth calcified segment of its abdomen. *Pylopagurus* conforms more closely to the present land type we have been describing, and chooses univalve shells

* Reports on the Results of Dredging in the Gulf of Mexico and Caribbean Sea by the U S. coast survey steamer "Blake." Descriptions of the *Paguridæ* by Milne-Edwards and Bouvier.

for a habitation, but its right "pincer" has undergone a remarkable transformation, being very thick, very solid, and bent at a right angle to the rest of the limb. *Ostracodotus*, on the other hand, repudiates any shelter at all. Its carapace is consequently completely calcified in all its length; but its abdomen, which remains soft, is reduced to insignificant proportions, and is so little noticed on a superficial examination, that at the first glance these animals seem to resemble true crabs. Yet another type—*Parapagurus*, shelters only a small part of its abdomen in a very small shell which is soon almost entirely absorbed by colonies of *Zoantharia*, a class of animal belonging to the coral-forming polypes. These hermit-crabs do not change their shells; for when once these are destroyed or absorbed, they find their shelter in the protective colony which grows upon them, and which lends itself to all their vital requirements.

We had the opportunity lately of watching a similar form of protection in the aquarium attached to the Prince of Monaco's magnificent deep-sea museum* at Monte Carlo; where there are kept some hermit-crabs, found in the Mediterranean, which spend their life in partnership with a beautiful sea-anemone, which grows and thrives on their backs. The hermit-crab has the advantage of the protection afforded by the anemone, which, in its turn, reaps the benefit of the constant change of location derived from the movements of the crab, a case of what is called "commensalism," which is as pretty to see, as it is wonder inspiring. Alcock, again, in his "Naturalist in Indian Seas," mentions a marine hermit-crab (*Chlænopagurus andersoni*) living off the Malabar coast, which does not at any time of its life use a shell as a refuge, but is always accompanied by a colony of sea-anemones which fits on to its hinder-part like a great coat or blanket.

Although it is generally admitted that the ancient ancestry of hermit-crabs can be traced back to the lobster-

*I have to thank the authorities for kindly permitting me to work in the excellent library attached to this highly-specialised museum.

like division (*Macrura*) of the more highly organized crustacea, rather than to the true, crab-like division (*Brachyura*), it is worth noting, that Milne-Edwards and Bouvier (loc.cit.) have called attention to the fact that quite different examples of hermit-crabs have been able to adapt themselves to an exactly similar mode of living, and if this is so, why should not crustacea of divers other groups have done the same? Thus they quote an instance of a deep-sea crustacean, which they have described under the name of *Cancellus parfaiti*. This crustacean has adopted exactly the same mode of living as *Pylocheles* (mentioned above), and is on a superficial examination the living image of it. But whereas *Pylocheles* has a primitive symmetry, which it has preserved by lodging among stones, *Cancellus* is a hermit-crab closely allied to the genus *Clibinarius* *; that is to say, it once lived in a shell but in taking to the same kind of shelter as *Pylocheles* it has recovered almost completely the symmetry it had lost. *Ostraconotus* again, to whose reduced abdomen and other characters we have already referred, suggests a true crab-like ancestry.

But these questions are too technical to continue any longer; besides, we are still left to grapple for an explanation of the steps by which our hermit-crabs have managed to extricate themselves from a life in the sea and take up a permanent residence on shore.

A naval officer is, they say, never happy until he has found a shore billet; and no more, apparently, was the land hermit-crab, although he was so greatly handicapped. The sailor simply walks ashore with his kit; the crab on the contrary has taken ages, not only to adapt his breathing apparatus to an air-breathing existence; but he has had to make arrangements (which we may be sure have taken æons to reach their present stage) whereby his offspring may be able to adapt themselves, during their nursery existence, to his present mode of life. Considering

* Examples of which we found in hundreds on the north shores of Swan Island.

that the hermit-crab has been trying to say good-bye for ever to the sea for so many ages (and so far as his adult life is concerned has been successful), these arrangements for his delicate progeny have so far fallen short of perfection that they are still dependent upon salt water; and after being hatched on shore must needs return to their old dominion, there to go through the various stages of growth which characterise their juvenile existence.

There are doubtless many people who are under the impression that when the eggs of a crustacean (water-fleas, barnacles, shrimps, lobsters, crabs, etc.) are hatched, a diminutive crustacean, identical in structure and habits with its infinitely larger parent, at once appears in the world. Such, however, is very far from being the usual case. Some crustacea, it is true, have become so highly developed or modified that they have been successful in this respect; so that in transferring themselves from the sea to land or fresh water, the various larval stages of existence (*Nauplius*; *Zoea*; *Megalopa*) through which ordinarily the young crustacean passes, have been suppressed, or rather hurried through in the egg, before the latter is hatched. The cray-fishes, for instance, have so succeeded. So has the ditch-prawn (*Palæmonetes*), and we might also mention the case of the river-crabs (*Potamonetes*). In all these forms the eggs hatch directly into the adult form. But the adult land hermit-crabs, land-lubbers as they have become in these days, have still to send their young to sea, where for a time they fend and shift for themselves, as the old sea-dogs did themselves. For some time, the eggs are carried about on shore, snugly hidden away in the shell which the female crab inhabits, and attached in large masses to the long hairs, growing on the well-developed limbs on the right side of the second, third and fourth abdominal segments of her body. After a certain period, not definitely known, the mother crab repairs to the sea-shore; and here probably, while she crawls about on the wet sand, or clings to the rocks on the tide-line, the salt water gains

access to the shell and leads to the further development of the eggs until they are hatched. Whether the hatched larvæ undergo a part of their development in the shell of the mother, which is thus filled with salt water, is a moot point, but Mr. Borradaile (loc. cit.) has himself seen in Ceylon two species of hermit-crabs of the same genus as the West Indian, covered with hatching embryos (*Zoœa*); and doubtless these quickly get washed off by the waves, as they break upon the beach, and then flow onwards over the bodies of the adult crabs. Thus are the young launched upon their temporary free swimming marine existence, where they pass from a zoœa stage, to a metazoœa, and finally into a creature called a glaucothœ.* When they return, they appear as small adult land hermit-crabs, each having appropriated a small shell suitable to its size.

To complete this long life history, for the length of which we must earnestly apologise, although it seems so interesting, not only from the actual strange facts which it discloses, but from the far larger problems of evolution which it implies; we may briefly state that the hermit-crab, as regards its food, is omnivorous, and is, in fact, a most useful scavenger of tropical islands and foreshores. On occasions they are cannibals, but they do not seem to fight among themselves so much as the hermit-crabs of the sea. The sense of smell which has been developed in these hermit-crabs seems to be something quite remarkable, and analagous to that of vultures (if indeed, vultures do possess an acute sense of smell); for if by any chance the body of a fish or animal is washed up by the sea upon the shores of a tropical island, hermit-crabs will descend in their thousands, from far and wide, to the scene of putrefaction; and marching along in great armies will quickly foregather to the feast; a sight which has been actually described by Mr. Wood-Jones in his "Corals and Atolls."

* Metamorphosis of the Hermit Crabs by M. T. Thompson, Proc. Boston Soc. Nat. Hist., xxxi., 1904, p. 147.

Finally, there is one other point to which we should like to refer. At the egg-hatching season, or just before it, hermit-crabs, as we have seen, repair to the sea-shore. In many cases, this may involve a migration from possibly miles inland, down mountainous slopes thickly overgrown with dense vegetation ; and only those who have tried to find a way down such slopes when they have lost the proper track, know what this entails. Thus we have the migratory instinct and *sense of direction* exhibited in yet another animal : and I mention it because it only seems to show how almost hopeless it is to try and explain the actual fact of bird migration, by anything more than the mere vague and convenient term of instinct. We may have some beautiful theories ; but in the end, we always seem to have to come back to this miraculous power which animals possess of "finding their way."

CHAPTER XII.

WHAT SWAN ISLAND REALLY IS.

AN IMAGINARY JOURNEY TO THE VAST DEPTHS SURROUNDING IT.

So far, we have merely tried to visualize, in a sketchy kind of manner, Swan Island as it appears to-day ; as it would appear to the average man who happened to land upon it—the completed, perfect thing, manifest above the water, with all its teeming freight of living things, both animal and vegetable.

In doing so, we have made reference to certain rather dry subjects ; such, for instance, as the peculiar marine deposits known locally as “fuller’s earth,” which may have appeared of little interest and hardly worth describing to some of those who may perchance have followed us so far. Of themselves, and by themselves, they *are* uninteresting ; but if, as we now intend to do, we ask a simple question, and try to get an answer, these and all other subjects connected with the islands will assume, perhaps, a rather different aspect.

What then, after all, is this “Swan Island,” which we have been discussing at such length ? How comes it to be *where* it is and *how* it is to-day—a thing of beauty, above tide-level, basking in the warm rays of a life-bestowing tropical sun ?

Let us try and see ; and incidentally to picture some of the conditions of life which obtain in the waters from which it has sprung.

It is a little difficult to stand on Swan Island, and looking due north, towards the Mysteriosa Bank, to realize fully what the sea is hiding beneath its smooth sunlit face, or to appreciate the fact that one is really looking across one of the most deeply furrowed regions which have been ploughed on the face of the earth.

Out there, beyond the reef, beneath the opal-tinted sea, apparently so smiling and so seductive, lies a region of awful depths, of impenetrable darkness, of fearful canyons and stupendous submarine ridges.

Hidden in the vast profundities of these horrid abysses, there lives an assemblage of weird and fantastic fish or other marine animals, under conditions which almost surpass belief—creatures of nightmare aspect, living a life of nightmare nature.

The little spot of consolidated coral debris, on which we have imagined ourselves standing, forms above tide-mark one of several patches of land, to "buoy," as it were, this extraordinary submarine region. The Cayman Islands mark its northern limits; and if the Mysteriosa Bank, which is a plateau of reddish coral, some twenty-eight miles long by seven miles wide, and sunk from ten to twelve fathoms beneath the surface, were now, what we presume it will eventually become, namely another coral island, it would go to form yet another mark to define that stupendous fold in the restless surface of the earth's crust, known to students of the sea bottom as Bartlett's Deep.

Bartlett's Deep extends for about seven hundred miles, right across the Honduran Sea. It commences in the bight of land known as the Gulf of Honduras; and ends opposite the southern extremity of Cuba, at the foot of the vast submarine declivity, which terminates, above sea-level, as the range of mountains called the Sierra Maestra, which extends from Cape Cruz to Santiago. According to Agassiz, it "has an average breadth of about eighty miles, and an *average* (*italics ours*) depth of twelve thousand feet." There are several places, within



CONTOUR MAP OF HONDURAN SEA BOTTOM.

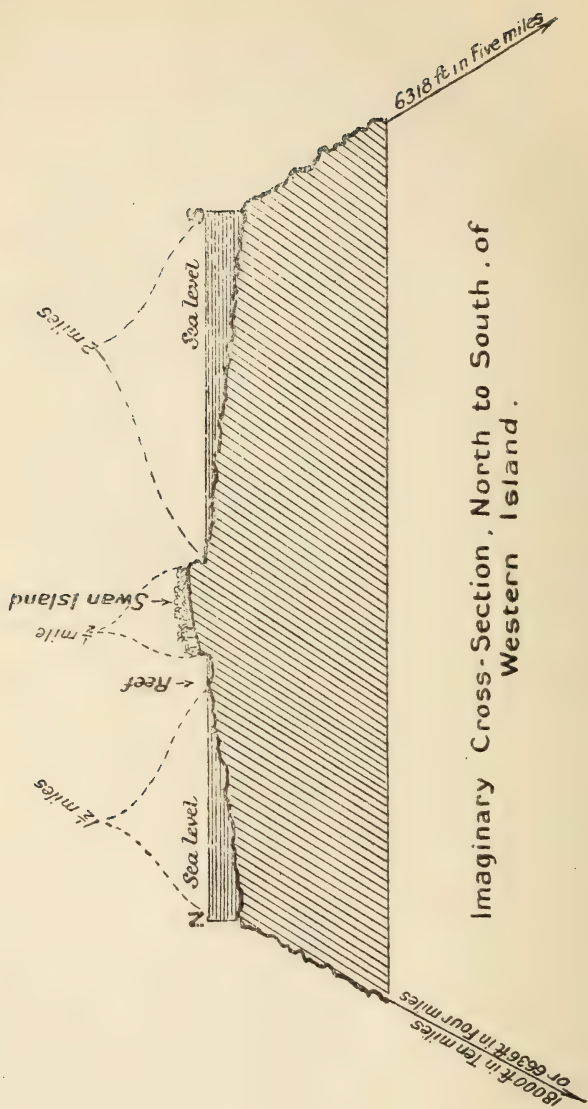
AFTER AGASSIZ: "Three Cruises of the Blake,"
Bull. Mus. Comp. Zool., Harvard, U.S.A., 1888.

its limits, where this depth is greatly exceeded. One lies at the foot of the range of mountains above mentioned; another at the base of the immense submarine ridge, of which the Cayman Islands form tiny aerial summits; and another immediately to the south of the Mysteriosa Bank. In all these localities, the depth of water attains to eighteen thousand feet; while just about ten miles to the north of Swan Island, there is another long and narrow canyon over one hundred and fifty miles in length, where the abysmal depth of twenty thousand feet is reached.

For a sea, as compared with an ocean, these figures are very remarkable: the very greatest depths discovered in the Atlantic, in one extremely limited area to the north of Puerto Rico, being for instance 27,366 feet—an appalling abyss. Twenty thousand feet is equivalent to three-and-three-quarter miles; but to realize fully what a depth like this means, one requires to have some other facts by way of comparison. Thus we might state, that in no part of the English or Irish Channel, or of the North Sea, does the depth exceed six hundred feet; and that in passing across the latter sea from the Wash to Holland, there would never be a greater depth than sixty feet beneath one. This, of course, is to quote extreme cases, but they are at least bases for comparison.

Perhaps a better way would be to imagine ourselves once more standing upon Swan Island, and the entire Honduran Sea drained of its water. We have already seen that Swan Island rests upon a bank, which is roughly ten miles long by four miles wide, and that the depth of water very gradually increases, from about five fathoms in the immediate neighbourhood of the island, to something like thirteen fathoms on the edge of the bank.

If, therefore, we imagine ourselves leaving the island and setting out to walk in a northerly direction; we should, for roughly two miles, proceed down a hardly perceptible slope, strewn with clumps of coral rock, and coated with coral sand and coral mud: until we suddenly found ourselves at a point where the ground fell rapidly away,



Imaginary Cross-Section, North to South . of
Western Island .

in slope after slope of slippery ooze, and at such a precipitous angle, that probably the only way of proceeding further would be to put on a pair of "ski" and glide, with breathless celerity, to the bottom. It is, however, more probable that we should not have a pair of "ski" at our command, and that even if we had, we should be far too daunted by the giddy prospect confronting us to attempt any such hypothetical descent.

Stretching away beneath us, right and left, and far beyond our farthest range of vision, would extend one of the grandest, deepest, and most awful valleys on earth. Eighty miles away in front of us, the stupendous Cayman-Mysteriosa ridge would rise like a long grey barrier wall, reaching for several hundreds of miles in a north-easterly direction towards the southern point of Cuba, and barring our further range of vision to the north.

Along its length, at almost equidistant intervals, would rise three isolated flat-topped peaks, towering skywards to a height of eighteen thousand feet. As the rays of a westering sun fell upon them, they would appear as if snow capped; but we should know that it was no snow which sprinkled their dizzy slopes, but the white coral sand and coral debris, which had fallen upon them from the reefs of the Mysteriosa Bank, the Grand Cayman Island and the united platforms of Little Cayman and Cayman Brac. Perhaps with a powerful telescope we could perceive upon the flat-topped summits of the two easterly peaks, the thinnest of green lines, denoting the woods and scrub which clothe their surface.

Twenty thousand feet below us, almost beneath our feet, down slope after slope of slithery smoothness and steepness, which would be coated for some way down with the same white coral ooze, the eye would light upon a long reddish trough, one hundred and fifty miles long—the Swan Island Canyon—the nethermost Gehenna of these vast depths, a veritable Valley of the Shadow of Death, a fit abode for "slithy toves" or "jabber-wocks." In all the vast prospect beneath us, there would be not the

faintest sign of plant life to diversify the dreary tones of the modified Globigerina and Pteropod ooze—no patches of green, or brown, or red, to give a hint of the presence of sea-weed growth—no relief to the imperceptibly merging monotonies of these lifeless declivities. Standing on the very edge of our plateau, we should shrink back almost appalled as our gaze travelled downwards to these silent, evil-smelling profundities.

Mont Blanc, the highest mountain in Europe, is 15,782 feet above the sea-level. Chamounix, from which mountain village most people content themselves with viewing its towering mass, is itself 3,400 feet above the sea; so that the actual height of the mountain above this well-known holiday resort is only some twelve thousand feet. Take this mountain block, as seen from Chamounix, and place it on the bottom of the Swan Island Canyon; and your gaze as you stood upon the edge of our plateau would travel down to alight upon its summit *eight thousand feet beneath you!*

The Eiffel Tower is nine hundred and eighty-five feet high. You could stand *twenty* Eiffel Towers, one upon the top of the other, and the top of the last would only just reach to the level of your sight as you looked across to the Mysteriosa Bank.

* * * *

As you stood there, and thought of the gracious sunshine bathing our two little islands, and of how it has brought into being such a superabundant train of animal and vegetable life, to charm the eye and allure the senses; you might well shudder at these hideous abysses, and at the ghastly conditions under which their deep-sea inhabitants live out their awful days of never ceasing darkness and unthinkable monotony.

For creatures live down there—weird fish-terrors, with jaws like a man-trap and monstrous teeth, so large that in the case of some species they prevent the mouth being closed; or again, with bodies ridiculously out of proportion to their enormous heads; creatures with rows of phos-

phorescent lights, displayed along their flanks, like the illuminated port-holes of an ocean-going steamer ; creatures with huge owl-like eyes black as night ; monstrous spiny crabs and fantastic lobsters, blind as Bartemæus ; fish again, which cannot be said to swallow their victims, but rather to draw themselves over them as in the manner of snakes ; fish with stomachs of such enormous distensibility that they can swallow other fish twice their own size.

It sounds like conjuring, but it is true.

The creatures of these nethermost depths, brood for ever in the appalling silence of an uttermost night ; preying one upon another in constant carnivorous strife ; living under a pressure which is almost inconceivable ; and in a temperature so low that it seems to defy the possibility of organic life.

Every hour of their life, every day, every year, is passed in the same awful stagnation of hideous changelessness, under circumstances of almost absolute uniformity. For them, there is no day and no night ; there are no seasons ; there is no sun ; there is no moon. There are no changes from warmth to cold, or from cold to warmth. We cannot even conceive that there is anything in the nature of sound. There is absolutely nothing to mark the flight of time.

Only the unhappy wretch doomed to perpetual solitary confinement in a dark cell, could fully realize the nightmare of this existence, as we humans can picture it. One could well imagine, that under such circumstances the mere excitement of being eaten alive by some species larger and fiercer than oneself would come as a positive relief.

These are no mere empty words—although, perhaps, it is not strictly correct to speak of absolute darkness, since many deep-sea fish are phosphorescent, and are provided with the most wonderful luminous contrivances, by which they are enabled to project rays of a feeble light in front of them, for the purpose of groping

their way about or capturing prey. But this light cannot have much carrying power, beyond the more or less immediate vicinity of the fish or beast concerned ; so that the latter's range of vision is probably much contracted. And however long its range of vision might be, it would be no better off, for there would be nothing to see, but the same dreary circle of faintly illuminated gloom, the same everlasting monotony of the drab-coloured ooze at the bottom.

But if we may be further permitted to wander from the immediate subject of "What Swan Island really is," let us quote a few examples to justify our words.

Here is how Agassiz, who worked in this very sea, graphically describes the chilliness of these great depths, such as surround Swan Island. "The great cold of the bottom water of the ocean, even in the Tropics, is best brought home to those who have examined the contents of a haul of the trawl. The bottom ooze is intensely cold ; and it is a strange sensation, while one's back is broiling beneath a tropical sun, to have one's hand nearly frozen from the stiff cold mud or ooze that one is compelled to handle while assorting the contents of the trawl."

Listen again, to how Mr. Alcock, in his most interesting book, "A Naturalist in Indian Seas," makes us realize the awful pressure to which deep-sea animals are subjected. "We had sent down in the trawl bag an untouched bottle of Bass's beer ; and when it came up, though the capsule and wires were intact, the cork was so much compressed, that it rattled in the neck of the bottle, and the bottle itself contained a mixture of beer and salt water.

"The pressure at a depth of 1,439 fathoms (8,634 feet), amounting to *nearly two tons on the square inch* (italics ours), had been sufficient to turn the cork into a pellet of hard wood, and to force the sea water under the capsule, and so between the mouth of the bottle and the shrunk cork."

Agassiz lowered, on one occasion, a bottle of champagne to a depth of 2,400 fathoms, with much the same results.

The pressure on this bottle must have been something like three tons, or 6,720 lbs. to the square inch.

We ourselves, living at ordinary levels, are subjected to a constant pressure of $14\frac{3}{4}$ lbs. upon every square inch of our body. Need we say, that if we or any of our friends were lowered to the same depth as Mr. Agassiz's champagne, we should never be able to be identified again.

Take again the question of light. Fol and Sarasin, by means of photographic plates let down beneath the surface, conducted experiments on the Lake of Geneva, which went to show that at a depth of five hundred and ten feet, the effect on the plates was no more than that which would be produced on a dark moonless night. Similar experiments in the Mediterranean, whose waters are ultra clear, gave a depth of 1,200 feet ; so that we may conclude that in general, at any depth below this, a profound darkness exists. This complete absence of sun-light at once puts out of count the possibility of plant life. And this all important factor in the economy of all animal life, human or otherwise, at once raises in its turn the question, how do deep sea animals ultimately live ?

But such questions, fascinating as they are, are too abstruse to enter into here.

* * * *

And so may be, full of thoughts such as these, we should, before walking back to our palm-strewn island, turn to gaze for a minute upon its emerald line of vegetation, set in the middle of our chalky-grey plateau—a beautiful oasis, amidst all this grey desert, formed of the dead and living organisms of a coral reef—a marvellous manifestation of vegetating wonder, a crowning glory to a deep laid scheme.

And having regained the island, we might be tempted to walk out once more ; this time for another two miles in a southerly direction ; and again at the end of our walk across the coral-strewn plateau, we should find the ground sinking rapidly away beneath our feet and falling dizzily to abysmal depths. Between us and the distant grey

slopes of the Honduran Banks, from which we have imagined the water to have receded, another yawning gulf would be fixed; and again we should creep back dismayed and full of a wondering awe. And so we might, in imagination, go on; taking a two mile walk in an easterly direction from the eastern end of the island, and a four mile walk from the westerly end; and each time be driven back by the same prospect of hideous abysses, covered with a slimy coat of evil-smelling slush and ooze.

At the western end of the plateau, we might even get a glimpse of the far distant "Yucatan Basin," as it wound its way round the western end of the Cayman-Mysteriosa ridge, to join with Bartlett's Deep—a broad submarine valley it would be, 15,000 feet deep, which must have nurtured in its ample bosom, through many a past and changing age of upheaval and depression, a host of strange life-forms, identical with those of their colleagues in the Pacific.

For it may be pointed out in passing, that the whole fauna of these Honduran depths is far more closely allied to that of the Pacific depths, than to that of the Atlantic; a fact explained by the much freer communication of the Caribbean Sea with the Pacific, than with the Atlantic, in Cretaceous and Eocene times, before the Isthmus of Panama had finally emerged to separate once and for all the two areas.

We should like too, if space permitted us, to dwell upon those times of vast land elevation in Pliocene days, when perhaps this Honduran sea region had shrunk and dwindled into one of long fiords or deep basins, which lay among high mountain ranges; when its waters may have been almost, or even entirely, landlocked, forming a retreat for those ancient deep-sea types of fish and other marine animals, which had been cut off from the deep waters of the Pacific in the past Miocene age, at which period Central America rose from its watery bed. Here, in these mountain-girt fastnesses, they were to hold out through these and other periods of elevation (Pleistocene),

and in these secure retreats to carry on their ancient race. We seem, in our present modern days, to see something of a similar occurrence, in the case of the elevated Nicaraguan Lake, in which tarpon still exist, completely landlocked and cut off from the sea.

But the main result of all our peregrinations, to which we must return, would be, that at last we should have got some true conception of what Swan Island really *was*; that we were marooned upon the isolated coral-crowned summit of a submarine mountain; or to put it in more scientific language, there had taken place in this neighbourhood, in past geological ages, a gentle orogenic movement of the earth's crust, which had gradually elevated this submarine mountain summit to a plane above the "limiting line of sedimentation," which elevation had permitted the growth of reef-building corals upon it, and so had, in the end, led to the formation of a coral island.

* * * *

But even so, we have not accounted for the marine deposits which lie beneath the coral capping of our island. In as few words as possible, we have endeavoured to explain how this vastly contorted Honduran sea-bottom has been affected by mighty subterranean forces, acting on an unstable and plastic crust, until there is hardly any sea-bottom like it in the world. We have seen how the foundations of Swan Island had been gradually uplifted, until they attained to such a height, that the surface-currents sweeping over them prevented the deposition of sediment upon them, and so made it possible for reef-building corals to grow and multiply. But, prior to this, something else had been taking place.

This something else took the form of a constant rain of the dead remains of millions of minute creatures (most of them microscopic) which once lived upon or near the surface of the sea, and which, when they had passed through their little life-span, fell in a never ceasing shower, upon the slopes of our submarine mountain slopes. Here,

they had either gone to form thick deposits of ooze and mud; or, like manna falling from above, had provided food for another vast host of larger marine animals (molluscs, crustaceans, marine worms, starfish, etc., etc.) which lived on or near the bottom, on the same slopes.

This surface population of minute creatures (or *Plankton* as it is now called) is of immense interest. It consists of a multitudinous community, of either microscopic, or exceedingly frail and delicate organisms; for the most part transparent or jelly-like and possessed of colours which harmonise marvellously with the tints of the water in which they live. This incredible host drifts hither and thither at the mercy of wind and tide; and while continually preying, one upon another, its individual members are as continually preyed upon, either directly or indirectly, by every creature of the sea which can exercise more or less volition in regard to its movements and conduct generally (*Nekton*).

Tempting as the subject is, it is impossible to do more here than state briefly, that starting on the lowest rung of the ladder of life, the creatures which make up this surface-drift in the Caribbean district, range from the most lowly forms of plant and animal life, like the Diatoms and Foraminifera, through the various divisions of invertebrate life, until they reach the pelagic molluscs.

Upon the ample bosom of the Equatorial current, myriads of fascinating life-forms, such as these, are borne along, the sport of wind and stream. Along its whole silent but majestic course, past the Brazilian coast, through the sieve-like chain of the Lesser Antilles, and over the warm surface of the Caribbean basin, this equatorial current had been dropping countless myriads of such like creatures, for countless generations, to strew the bottom of the sea; and as it swept over the site of what would one day be Swan Island, it dropped countless others, before it passed on its irresistible course through the Yucatan Straits on its way to become the Gulf Stream. Once arrived at the bottom, the "fleshy" parts of these

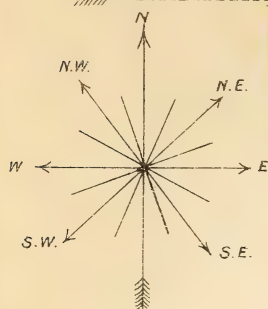
lowly animals would soon have become disintegrated and have disappeared, leaving nothing but their frail and delicate frameworks of limestone to accumulate in ever-growing thickness. Many even of these relics might eventually be resolved into mere formless mud or ooze, and their tale would be increased by the constant addition of the dead remains of the bottom-feeding animals to which we referred above. But enough, perhaps, has been said to indicate the origin of the marine deposits which underlie the coral capping of our islands.

PART II.—BLANQUILLA ISLAND.

“There is a pleasure in the pathless woods,
There is a rapture on the lonely shore,
There is society where none intrudes
By the deep sea, and music in its roar;
I love not man the less, but nature more,
From those our interviews, in which I steal
From all I may be, or have been before,
To mingle with the universe and feel
What I can ne’er express, yet cannot all conceal.”

CHILDE HAROLD.

LATITUDE $12^{\circ} 55' N$

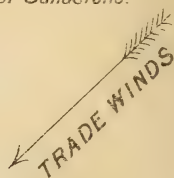


DAMPIER'S
ANCHORAGE
IN YEAR 1682.

Yellow = Sand or Sandstone

Green = Coral - Limestone

NOTE: All the rest of Island consists of
Granite (Biotite) or Sandstone.



Scale.

1 Inch to about One Mile

LATITUDE $12^{\circ} 49' N$.

ISLAND of BLANQUILLA.

PLAN DRAWN FROM OFFICER'S ROUGH CHART.

CHAPTER I.

A LONELY "DESERT ISLAND" AND A HERMIT.

IF you, dear reader—gentle or otherwise—have never felt the pleasant thrill of expectancy which attends one's first setting out to explore some out of the way haunt of bird or beast, hidden in some remote corner of our island kingdom (or for that matter any other kingdom), be it in the shape of marsh or moor, forest or rocky shore line, or during, may be, some long overdue holiday; you will not, we expect, have much sympathy for our feelings as we first set eyes on Blanquilla.

The island of Blanquilla was then, as far as its birds were concerned, an unknown quantity. For all we could tell it might contain a prize or not, but in any case, by reason of its isolation, it was sure to hold something of interest to repay the trouble of a visit.

We had left Port of Spain, in Trinidad, on April 4th, 1906, bound for Cuba, and Sir Frederic had turned aside, a little out of his course, to pay a flying visit to this lonely little island. It was the first taste of exploration, humble as it was, that we had ever experienced; and I for one, as we slowly crawled towards its low shores, felt like some impatient school boy eager to be off bird's nesting.

"I ask my young countrymen, not for a moment to believe that there are no more Guanahani shores, no more peaks of Darien, that the work of Nasamonians is finished, and that there is nothing left to do but to make exact surveys." So wrote Sir Clements Markham, a little while ago, in an attempt to encourage the real stern

work of geographical exploration, of which there would appear to be still plenty left to do for those ambitious enough, or for those who are in the position to undertake it.

But it is not every one's lot to endeavour such high emprises as those, and fortunately, without aspiring to such heights as geographical exploration, there are still left humbler fields and spheres where the naturalist may find his Guanahani, be it at home or abroad. Or so at least we thought, as on that day in April, five years ago, the modest little island of Blanquilla rose unobtrusively from the sea, and we watched its low line of tawny yellow gradually resolve itself from the vague horizon, where sea and sky merged into one.

There must be few people, even among those who are well acquainted with the West Indies, who have ever seen or heard of this little island. It lies, so to speak, on the fringe of a continent ; being situated on the very northernmost edge of the continental shelf which extends from the mainland of Venezuela, ninety-five miles away to the south. Roughly speaking, it is a pear-shaped island, with its thin end pointing due north, and with its base to the south. It has a length of between six and seven miles, while the breadth at its southern or widest part is between four and five.

Of all the islands strung out along the Venezuelan coast, less seemed to be known of the natural history of Blanquilla than of any ; and of any other kind of history it is fortunate in possessing practically none. Dampier in 1682 landed on it and stayed ten days. What he and his companions found to do during such a long visit, on a desolate and uninhabited island, is rather a mystery ; but, as we shall have occasion to note later on, he gives as good a description of the island as any of the more modern naturalists who have been there. Humboldt talks about it, but was never on it. Dauxion Lavayasse * visited it in 1807 and stayed three days. About the middle of

**Voyage aux îles de Trinidad de Tobago, etc.* Paris, 1813.

the last century a Count Dalmas went there, like us, to see what it might contain in the way of birds ; but he never published the results of his observations, and his collections seem to have been lost sight of. Lastly, in 1883, Richard Ludwig, a German geologist, made a very short visit to the island. He gives its size as sixty square kilometres, and agrees with Lavayasse that it is formed of granite-like (*granitisch*) rocks with patches of coral (*Korallenbauten*) on the shores. Finding no guano deposits, for which he was apparently looking, the island does not seem to have interested him.

When first sighted, Blanquilla appears low, flat, barren and uninteresting. Nothing, indeed, could have looked less promising as we got our first impression of it ; and our spirits, elated with the prospects of exploring new ground, and with the hope of possible surprises which its bird-life might have in store, sank to zero. But as the yacht ploughed on, and the distance gradually lessened, matters began to improve. The uniform drab, or almost tawny yellow, which looked so dreary and uninviting from a distance, gradually crystallized into more definite shapes and colours. Large patches of grey deepened into green, or were picked out here and there with smaller patches of deeper green still. The greens, in their turn, became recognizable as savannas and woodland, the greys as large stretches of cactus scrub. The vague coast line became differentiated into low cliffs, gently curving bays, fringes of green mangrove bushes, and rocky promontories. There was a line of white where the sea broke upon the shore.

As we drew in closer still, and individual objects became clearer, our surprise grew ; for Blanquilla presented an appearance which, as far as the Caribbean Sea and its islands are concerned, is practically unique. Except for a fringe of cocoa-nut palms in one restricted spot, there was not a hint of the Tropics in the whole scene. One seemed to be nearing an island of rolling, grassy downs ; while here and there, perched on the tops of rounded

knolls, or nestling snugly in the folds of sheltered little dells, appeared small isolated coppices or very circumscribed woods of vivid green. From this distance, it might all have passed for a little bit of Devonshire. The land sloped gently up from the shore, undulating or carved out into ridge and gully, till it gained a central plateau dotted with more clumps of low trees and bushes and thinly covered with grass. Now and again, huge piles of fantastic and weather-worn blocks of granite, smooth and massive, crowned the softly moulded slopes of some low hill, like the ruins of a mediæval village. They reminded us, in fact, of the villages, or ruined castles, one so often sees perched on the tops of hills in the Riviera.

This savanna-like appearance of the island was quite unexpected; and its homely and untropical aspect was enhanced by seeing what we thought to be herds of cattle grazing here and there upon its slopes. As we drew in closer still, our cattle turned out to be donkeys and goats; and later on we discovered, to our cost, that distance gave a somewhat flattering and softened tone to a scene, which a profusion of cactus, growing everywhere all over the island, quickly did its best to dispel on a nearer acquaintance. Thick and impenetrable, however, as the cactus scrub proved in places to be, where it easily held its own, there were still large areas of country where one could wander and even ride freely and at ease, nay, some where, with a little effort of the imagination, one could almost call the thinly growing grass "turf."

Blanquilla has, indeed, what one may be excused for calling a "golfy" appearance; and as one wandered later over its broad open stretches, the thought of this alluring game recurred constantly to the mind. It is along its southern and western sides that the nature of the ground gives one this impression; and here, in the intervals of looking for birds, we found ourselves unconsciously choosing ideal "holes," and makingsporting "approaches;" or gazing curiously at the strange cyclopean piles of rock which crowned many of the eminences, like so many



WEATHER-WORN GRANITE—BLANQUILLA.

[To face page 148.]

Devonshire Tors. And how welcome, as a temporary change, the appearance of such country is to the eye, wearied with a large dose of tropical forests, only those who have known what it is to grow sick for the sight of an English meadow and simple pastoral scenes can know. One can, and does, become "fed up" at last, upon these highly seasoned and cloying dishes of everlasting and unvaried tropical richness. We were fresh from the prodigal luxuriance and riotous vegetation of Venezuelan forests and West Indian islands, where one's outlook is often cramped and confined by dense barriers of impenetrable verdure. One feels at times almost suffocated by it. There are other times, especially when one is trying to force a way through it, when an overwhelming sense of irritation creeps into one's pent-up feelings, and finds expression in either words or actions. One slashes away at the creepers with a sense of personal spite, and longs to be free.

This island came as a breath of the open. The soft Trade-winds sweep it from end to end. The air is dry and fresh, instead of sweltering and humid. One walks freely and at ease—untrammelled. The eye roves over its broad stretches of struggling grass and the grey-green of its acacias and lantana bushes and experiences a rest. There is space; there is freedom; there is "distance." One seems to have freed oneself, at last, from the clinging undergrowth and creepers of the forest, and to have emerged into the open and the sunlight.

When we first sighted Blanquilla, our knowledge of it was limited to the information we had gleaned from the six lines with which it is dismissed in the "West India Pilot." Brevity of description, however, boded good in one sense; for if little was said of it, it afforded ground for the assumption that it was uninhabited and worthless from a commercial point of view, and therefore that we were more likely to find a spot uninfluenced by the meddlesome interference of man. It was, therefore, a surprise when the first things we saw were the large herds of donkeys and

goats, and undisputable evidence of the presence of man in the shape of what looked, from a distance of a mile or more, like a comfortable homestead.

A second surprise came in the discovery of the fact that the anchorage, as given in the "West India Pilot," at the south-west corner of the island, does not seem to exist. It is, in fact, a dangerous corner. This last, however, was a matter of small account; for Captain Lebbern, by hunting about along the southern coast for a berth, found a comfortable one sheltered from every wind but the south. It is situated about the centre of this side of the island, opposite a pretty sheltered cove, in which the water is of crystal clearness and the bottom composed of pure white sand, variegated by big clumps of coral and patches of waving seaweed and sea-fans.

At the head of the cove, the limpid water laps gently upon a sloping beach of more sand, white as snow and soft as down to the naked feet. On either hand, low cliffs of granite, capped with coral limestone, and tricked out here and there with green bushes, give a welcome shade from the sun. It is a restful little nook, and might well have given shelter to a group of syrens or sea-nymphs; but if it did not quite come up to such romantic ideas, at any rate it made an ideal bathing place; and the sailors usurped the place of these alluring sea-maidens, who were doubtless too modest to appear, during their frequent visits to it in a state of nature. We christened this cove Zenaïda Bay, after the name of the yacht.

Half a mile or so to the west of our anchorage lay a curious lagoon-like inlet, the entrance to which is formed by a sudden break in the low cliffs. On the occasion of our first visit to the island (April 5th, 1906), being too impatient to remain on board while a suitable anchorage was discovered, a boat was lowered, while the yacht was still under weigh, and we made for its mouth. Once inside, we found the water smooth as the proverbial duck pond; and rowing along the mangrove bushes lining

its low wall-like sides, found them to be tenanted by two kinds of heron, both of which were nesting. One was a night heron (*Nycticorax violaceus*) and the other the little green bittern (*Butorides robinsoni*), specimens of whose eggs we procured. It is worth noting that the little green bittern of Barbados nests in May, June and July. In these mangrove bushes we also noticed several large iguanas of a very dark colour, and one was so suspiciously close to a nest of one of the night-herons, that there seemed to be little doubt in our mind that it was there for the express purpose of helping itself to an egg or two.

At the end of this peculiar inlet of the sea, which seemed more like a gigantic dock than the work of Nature, stretched a perpendicular wall of very high mangrove and avicennia trees. They grew luxuriantly from the dark festering slime of a swamp; and their branches were full of birds, attracted by an abundance of insect life. A narrow path had been hacked through the dense undergrowth, and following this we gained the dry land, and found ourselves in the cool shade of a small cocoanut grove.

We stood for a moment to take in the scene, curious to see what manner of island this was, which we were about to annex in the name of the British Ornithologists' Club.

After the glare of the sea and the glassy water of the lagoon, the light here was wondrously subdued, and we were in no hurry to plunge again into the full blaze of the sun. Above our heads the soft Trade-winds dallied with the feathery branches of the palms. Now and again, their fronds rattled lightly against one another, intensifying the silence which reigned beneath. Through the groined dome, formed by their graceful branches, the sun glinted here and there, and threw great splashes of gold upon the sandy soil beneath.

Grass was growing about the bases of the grey pillar-like trunks in patches of deepest green; in vivid contrast to that which we could see beyond in the full glare of the

sun. Above us, among the branches, was the faintest hum of insects, always a noticeable and pleasant sound to anyone fresh from the sea ; and the soft cooing of an amorous dove was borne to us on the drowsy air from the mangrove swamp. Here and there, a lizard rustled noisily among the dry brown fronds, which had fallen from the trees ; and in the silence of this temple of Nature our lightest footstep put to flight the birds which it contained.

Opposite us, upon the slopes of the rising ground, which we could see through the trees, stood a solitary palm-built hut. Roughly thatched and roughly made, it had an instant fascination, and was the very thing one had always pictured in one's boyhood as being inseparably associated with desert islands. We fell in love with it upon the spot. It stood "in its own grounds," and these formed a perfect little oasis in the midst of a wilderness of granite boulders and cactus, which rose like an amphitheatre around it. A tall fence, which would have done credit to Robinson Crusoe himself, kept at bay the encroaching hordes of cactus and saved the crops within from the onslaught of wandering goats. Inside this ring-fence were flourishing the fruits of the owner's labour—patches of cotton, snow-flecked with bursting capsules of silken down ; green crops of waving Indian corn and guinea grass ; a plot of sweet potatoes and yams ; a little sugar cane, and a small grove of bananas. A pomegranate tree, loaded simultaneously with rich red blossom and golden fruit, and some tall hibiscus shrubs, also in full blossom, formed a patch of gay colouring, and a little shade, by the door of the hut, where slept a cat and a dog.

As we drew near, the dog woke, and came running and barking down the little winding path which led to the cocoanut plantation ; and then "Robinson Crusoe" himself appeared, at the threshold of his house, and stood shading his eyes from the sun to see what manner of men had come to usurp his peaceful seclusion. A minute later,



THE HERMIT'S HUT.

[To face page 152.]

he had shambled down the path, and with strange, old-world politeness, had bid us welcome to his stronghold.

Afterwards, we came to recognize this old man for the Hermit of the Island. Here he lived entirely by himself in solitary loneliness. There are only two other human dwellings on this rather strange island. Each of them is more than two miles distant, and his only link with human intercourse is a little path, which winds its way, up hill and down dale, through a wilderness of cactus and rocks. Why he lived here, in this most primitive of dwellings, was a mystery we never solved.

But it was strange to see, what an attraction his little fenced-in homestead had for our sailors, whose steps invariably led them to visit this old anchorite, who, on his part, seemed always pleased to do the simple honours of his strange abode.

According to his own account, he was the brother of the man who rented the island from the Venezuelan Government, and who lived in patriarchal style in the "homestead" at the south-west end of it. Here, in later visits, we found a little family coterie, at the nominal head of which was the still more aged father of these two brothers. This venerable Abraham, with his children and his children's children, to the fourth generation, possess the land; and everywhere their flocks multiply and replenish the earth. Not another alien soul obtrudes his unwelcome presence upon their island home, which is nothing more nor less than a huge donkey and goat ranche. Here, too, they have dug their wells, that their flocks may drink; but if, like Abraham, they possess much gold and silver, it is not apparent from their mode of life, which is extremely primitive.

Possibly, in the case of our old hermit whose acquaintance we first made, there had been some family feud or some jealous Sarah, and he had been turned out to wander alone upon the face of the desert. Possibly, it was merely his pleasure to lead the simple life, or rather the *still simpler* life. At any rate he seemed happy

enough; and if it is true that according as our wants are few and easily supplied, so are we proportionately happy, the explanation of his happiness was easily forthcoming. His wants, in fact, seemed strangely few. His house was built of material which he had but to go a few yards to find all ready to his hand. The mangrove swamp supplied him with poles and sticks for its framework. Its roof and walls were thatched with palm branches stripped from his cocoanut plantation. His furniture was of the simplest—a home-made bed, a table, and a box to sit on. His cooking utensils—a few earthenware pots and pans. His fireplace—the floor of his hut; his fuel—the husks of the cocoanuts. He ground his own home-grown maize in a stone quern, which might well have dated from Neolithic ages. For milk and meat he had his goats; for eggs his fowls; and a better or healthier lot of these last you could not wish to see. Bananas, cocoanuts and pomegranates furnished him with dessert; sweet potatoes and yams with vegetables. What he did with the cotton plants which grew in such luxuriant profusion round his little estate we never discovered.

His whole compact little holding, was, in fact self-supporting; and as we have said, was fenced in as securely as ever was Robinson Crusoe's. Indeed it was some little time before we discovered the proper way in. Once, as in the case of Remus and the walls of Rome, we vaulted over it to save going round, but with instant regret; for it was evident from the look of humbled pride in the old man's eyes that we had hit him in a tender spot. There was only one thing we could never have brought ourselves to face, and that was his water supply; for he had sunk his well on the borders of the mangrove swamp, where gruesome land-crabs and other noisome creatures of slimy aspect, stirred up its muddy brackish depths and made one shudder.

The sailors loaded the old man with gifts, among which plug tobacco must have played a prominent part; for we never saw him afterwards without a tell-tale trickle of



BLANQUILLA—A CURIOUSLY ROUNDED BLOCK OF GRANITE.

[To face page 155.]

brown juice running from the corners of his mouth. In other words, he preferred to chew. Whether this old man was a philosopher, we do not know, for our conversations were mostly carried on by means of a Spanish-speaking sailor; but at any rate he was a veritable child of Nature.

The present of an axe, which could do more work in ten minutes than his poor "machête" could perform in several hours, caused him the most extreme joy: and he felt its edge as lovingly, and handled it as carefully, as a hunter would the rifle which stood between him and starvation. Matches he prized and cherished, as if they had been worth their weight in gold, as doubtless they very nearly were to him; for had his fire gone out, he must needs walk two miles to borrow some; and failing this source the nearest were on the mainland, ninety miles across the sea. To see the infinite care with which he struck one made us realize somehow, more than anything else, how lonely and isolated this man was.

Close to the old hermit's enclosure, and lying perched on a rather steep slope, was a large, almost perfectly spherical mass of granite. It was so round and so oddly isolated, that when we first saw it from a distance, we thought it might possibly be of meteoritic origin. A closer inspection shewed that it owed its shape to the influence of simple weathering, softness of the particular kind of granite of which the island is mainly composed (*Biotite* *), and its position on the slope. The photograph of it, and of other bizarre shapes assumed by some of the rocks at the southern end of the island, will give the reader some idea of the part played by wind and rain, especially the former, in the sculpturing and wearing down of the surface of this island: for undoubtedly, when first it emerged from the depths of the sea, Blanquilla was far from presenting the smooth, planed down surface which almost everywhere it does to-day.

* From specimens kindly identified for me by Dr. Pryor, of the South Kensington Museum.

It was only from these great piles of isolated and odd-looking rocks, which crown so many of the smoothly-rounded eminences, and have been able by their greater hardness to hold out the longer against the pulverising processes, that we could get any idea of the formation of the island. But on the subject of geology we shall have a few remarks to make in a later chapter.

CHAPTER II.

BIRDS.

THE first time we went to Blanquilla, our stay was limited to one day (April 5th, 1906) ; but although we were late in landing, and much time was necessarily taken up in going from one part to another, so as to cover as much ground as possible ; yet, by dint of hard walking and hard work from the time we got ashore until we left at 5 o'clock, we managed to secure fifty-three specimens of birds, twenty to thirty lizards, several iguanas, a small collection of land-shells, some eggs, and a field-mouse.

Of this day's collecting, undertaken in the scorching rays of a tropical sun, on an almost shadeless island, we shall always have a lively recollection ; and so, we imagine, will Mr. Barton, head-steward on the yacht, who is a keen naturalist and a most enthusiastic and energetic field-collector, to whom we owe much, for help willingly given. Nor must we forget to mention the indefatigable efforts of two sailors, Courtman and Gilbey, who, towards the end of the day, as the results of innumerable encounters with the cactus, appeared like nothing so much as walking pincushions.

There are possibly some people who might think that the above-mentioned bag does not represent a very strenuous day's work ; and that to be reduced to including a mouse is drawing things rather fine. Yet the mouse, besides being possibly a very important representative of the fauna of the island, gave us nearly as much trouble to catch as the lizards ; and if anyone wants to know what

strenuous work really means, let him try to catch lizards, with only a butterfly net as a weapon, in a blazing tropical sun. There are many better ways of catching these lively reptiles than with a net ; but they all entail time, which was just the thing we lacked. I do not know just how many million lizards there may be on Blanquilla—certainly a great many more than we have seen before or since, in any part of the world : yet, plentiful beyond imagination as they were, the cactus “prickles” beat them easily ; and every dab at a lizard, successful or otherwise, produced at least one prickly horror, till the net itself looked like some strange and horrible new variety of these strange plants. That lizards hibernate, even in the Tropics, was evident from the fact that whereas in April the island seemed overrun with them, in a subsequent January visit their numbers had diminished to such an extent that we hardly seemed to notice them.

The very first bird we saw, when we had once set foot on shore, near the cocoanut grove, was a humming-bird (*Chrysolampis moschitus*), and the second was a parrot (*C. rothschildi*). The humming-bird was glancing about beneath the flowerless branches of the tall mangrove and manchineel trees ; every now and then making a little dash at some insects on the under-surface of the leaves. The parrot flew screaming from the branching head of a cocoanut tree. Both birds were sufficiently surprising to see on such a barren-looking island ; and we shall have more to say about them further on.

In the meantime, more birds were making themselves evident, as we began to extend our search around the old man’s plantation. His patch of cotton was crowded with ground-doves (*C. perpallida*), which kept jumping up from the ground at almost every step we took. Many golden warblers (*D. rufopileata*), looking like so many canaries, were creeping about in the patches of cactus scrub, where some flowering bushes (*Lantana*) appeared to afford them plenty of occupation. Tyrant-birds (*T. dominicensis*), winter-visitors from further north, frequented

the margins of the mangrove swamp; and on the arid sun-baked slopes further away, where dwarf melon-cactus and coarse grass struggled for the mastery amid a wilderness of big weather-worn blocks of granite, we came across numbers of small black finches (*Euetheia johnstonei*), which were feeding on minute seeds of grass, and picking up a living, where no living seemed to be visible. These little finches, the ground-doves and the golden warblers were certainly, with perhaps the exception of some mocking-birds, which we afterwards discovered, the most numerous and typical of any of the birds on the island.

The little finch belongs to a genus which is found all over the West Indies, as well as elsewhere on the mainland of Central and South America. In all the various localities where they are found, they vary greatly in depth of colour, size and other details; but this particular one seems to be the darkest of any, adult males being almost uniformly black. So black, indeed, did they appear, that we noticed the difference at once; and as a matter of fact, it turned out that this was the only new species we found on Blanquilla. We afterwards had the pleasure of naming it in honour of Sir Frederic Johnstone. Like the dove and the warbler, they were remarkably tame and confiding; nearly as much so as a London sparrow.

As, previous to our visit, no account of the birds found on Blanquilla had been published, and nothing was known of them; it may be interesting, before making any more remarks, to append a list of those we found there. For the sake of brevity I have not included any sea-birds:—

(1) Curaçao ground-dove (*Columbigallina perpallida*), exceedingly common and extremely tame.

(2) Zenaïda dove (*Zenaida* sp. ?). Two examples seen, but neither secured.

(3) Great blue heron (*Ardea herodias*). A winter visitor here, and only seen on our January visit.

(4) Night-heron (*Nycticorax violaceus*). Was nesting here in April.

(5) Robinson's green-heron (*Butorides robinsoni*). Also nesting here in April. Eggs taken.

(6) Caracara (*Polyborus cheriwayi*). Several pairs of this large hawk seen.

(7) One or two buzzards (*Buteo* sp. ?) frequent the island, probably attracted by the mice and lizards.

(8) Two or three small falcons (*Cerchneis* sp.?) were seen at the southern end of the island; but we did not succeed in getting a specimen to identify with certainty.

(9) Rothschild's parrot (*Chrysotis rothschildi*). Seen in numbers, but more in the month of January than in February or April. Found in Curaçao group of islands (*Bonaire*).

(10) Belted kingfisher (*Ceryle alcyon*). Frequented the shores of the island, where it seemed to lead a semi-marine existence.

(11) Ruby-and-topaz humming-bird (*Chrysolampis moschitus*). The vagaries of this little bird are noted below.

(12) Curaçao crested flycatcher (*Myiarchus brevipennis*). Not a conspicuous bird. Lives in quiet haunts in shady bush-country.

(13) Grey kingbird (*Tyrannus dominicensis*). Probably a winter visitor only.

(14) Curaçao mocking-bird (*Mimus gilvus rostratus*). A great quantity of these birds inhabit the island.

(15) Curaçao yellow warbler (*Dendroica rufopileata*). Quite common, and found among the aromatic herbaceous plants which abound on the island, wherever there are trees.

(16) Johnstone's grass-quit (*Euethia johnstonei*).

From a glance at the above list, it will be noticed, that with the exception of the small black finch or grass-quit, the resident land-birds of Blanquilla agree in being similar to corresponding species, or rather sub-species, found in the islands of Curaçao, Bonaire and Aruba, which lie two hundred and sixty-four miles distant to leeward. If we exclude the island of Margarita, which,

from its nearness to the mainland and the height of its mountains, contains a few resident species not found in the other Leeward Islands,* we may (with one or two exceptions to be noticed later) say the same of all the purely resident land-birds found in the islands of this outlying group. That is to say, they are all species which have been derived from the mainland or from the windward group of the West Indian islands; but from their prolonged isolation in these outlying islands, they have become modified into sub-species, climatic races, or geographical forms, whichever you prefer to call them.

Favourably situated as the islands are, in the matter of intercepting stragglers driven out to sea by the Trade-winds, they have acted, in some degree, as a net, which has "mopped up," from time to time, influxes of unwilling emigrants from the Antilles and the mainland.

Why the Blanquilla grass-quit should have assumed an even darker colouration than the Venezuelan bird, while the Curaçao grass-quit (*E. sharpei*) has become modified in an opposite direction, until its under-parts have assumed almost a light slate-colour, is a difficult matter to explain, seeing that the conditions under which both species live are apparently quite identical.

The ruby-and-topaz humming-bird, whose acquaintance we first made on the island of Blanquilla, almost immediately we had landed, was rather a puzzle to us. On our first visit to the island in the month of April, this delightful little bird was everywhere evident, and charmed us with its jewel-like scintillations. It frequented the thickest of the cactus patches; darting in and out between their tall columnar stems, hovering over a flower here or a cactus fruit there; and leading us on to many a prickly chase. We shot and preserved a series of eight, and if so disposed could have secured more. In February of the following year, although we covered far more ground than

* By "Leeward Islands" I mean the chain strung out along the Venezuelan Coast.

on our previous visit, we only saw a single specimen (a male in full plumage) ; and in January of the year following that, not a single specimen was seen. The only explanation that we can advance, is that possibly this diminutive little bird is in the habit of migrating annually during the winter months to the mainland, flying backwards and forwards over ninety-five miles of open sea ; or else that it only occurs in casual influxes. In any case, Blanquilla would seem to be the most northerly limit of its distribution.

A still stranger fact, is that this humming-bird is not found on Margarita Island, which is very much nearer the mainland, where it is common. It can hardly be that the conditions found in Margarita are not suitable, for three other humming-birds are found there. Yet the fact remains, that neither Mr. Wirt Robinson nor Mr. Clarke found it on Margarita during the summer, and I myself only came across one solitary specimen, which was an obvious straggler, during two winter visits,* in which we covered a great extent and variety of ground. Such is another instance of the strange anomalies of distribution so often seen in visiting any outlying islands, all the more strange too, in this case, since the vegetation frequented by this bird on Blanquilla is found in abundance on Margarita.

But very often an island may be almost as interesting for what it does not contain, as for what it does ; and in this connection, we were surprised to find on Blanquilla no examples of the following genera, all of which are quite common along the coast of the mainland, and some of which are also found in the islands of Margarita, Curaçao, Bonaire and Aruba. These genera were *Cardinalis* (cardinal finch), *Conurus* (parakeet), *Quiscalus* (grackle), *Icterus* (yellow oriole), *Dendroplex* (woodhewer), *Melanerpes* (woodpecker), *Cæreba* (honey-creeper), and *Polioptila* (gnat-catcher). It was all the more surprising, as there

* Lowe, on the Birds of Margarita Islands, Venezuela. Ibis, 1907, pp. 547-570.



A COLLECTING PARTY ON BLANQUILLA.

[To face page 162.]

seemed to be no obvious reason, as far as vegetative and other conditions were concerned, for their absence ; the flora of Blanquilla presenting remarkable similarities both to the above mentioned islands and to some parts of the coastal belt along the mainland.

One might have thought that isolation from the mainland had been responsible for the absence of some of these birds ; but if such diminutive creatures as the ruby-and-topaz humming-bird had been able to find their way thither, what was there to prevent these much stronger birds from doing so too ? It may be answered that humming-birds, being such mere feather-weights, would be more liable to be driven out to sea, willy nilly, by storms ; but, on the other hand, if strong-flying birds like parrots have been able to establish themselves on the island and found conditions suitable, why should not parakeets, to say nothing of the other birds ?

But if mere isolation or distance has been the cause of the absence of these birds from Blanquilla, it assuredly could not have had any influence in the case of islands like Curaçao, Bonaire and Aruba, which on a clear day are in sight of the mountains on the mainland. Yet on these islands we find no grackles, no cardinals, no wood-hewers, no wood-peckers, and no gnatcatchers ; and this, in spite of the fact that better adapted country for the first four, at least, one could hardly want to see, judging merely from a comparison of the conditions found in Margarita and on the mainland, where we have found these birds exceedingly common. But if this is not enough to accentuate the eccentricities of distribution, we may state that we found grackles on the Hermanos Islands, which are only ten miles from Blanquilla, nearly ninety from the coast, and some forty miles due north of Margarita. That is to say, they are as far from Margarita (where grackles are common) as Curaçao is from the mainland.

It would seem, in fact, as if there was nothing more fortuitous, one might almost call it fickle, than the causes

which have governed the distribution of some of these species. Food, of course, is one of the most obvious causes which determine the presence or not of a species in any particular locality ; and in this connection we have wondered if the presence of numerous grackles on the Testigos and the Hermanos Islands has not been determined by the fact that so many hundreds of gannets are accustomed to nest on them. It may be that the grackles have been attracted to the islands for the purpose of picking up a living, derived from the " crumbs " left about the nests during the process of feeding the young gannets ; and that they have consequently elected to take up their abode on the islands, eking out the rest of the year on an insect diet and on the proceeds derived from other sea-birds, which also nest there in their proper season. At any rate, it is a curious fact that no grackles are found on Blanquilla, the Curaçao group, or any of the other smaller islands off the coast ; and on none of these, with exception of Isla de Aves, do gannets breed.

The absence of honey-creepers from Blanquilla seemed to us even more strange than in the case of some of the other birds mentioned ; for apart from the fact that these pretty little birds are found on almost every scrap of land surrounding the Caribbean Sea, there are large numbers of low bushy trees of the mimosa tribe, together with logwood and guaiacum trees, which these birds constantly frequent elsewhere. Another curious fact, is the apparently haphazard way in which the species of this genus have spread themselves over the islands of the Leeward group in general. Their distribution seems almost as fortuitous as the distribution of thistle seeds driven by the wind. For example, we have in the Testigos a *black* form (*C. lauræ*), obviously derived from the Southern Antilles. In Margarita and Tortuga, the species found are *normally coloured species* (*C. luteola* and *C. ferryi*), derived from the mainland. Further westward still, after skipping Margarita and Tortuga, we again come across another *black* form (*C. lowii*), on the Los Roques islands ; and again

further westward, in the Curaçao group, we find a normally coloured race (*C. uropygialis*), whose nearest allies are far away in the islands of Martinique and Barbados.

As regards the grey kingbird mentioned in our list, we only met with this bird in our January visit, and there is little doubt that they were winter migrants from the Greater Antilles. Gosse* relates that migratory flocks of this bird leave the island of Jamaica by the end of September and return regularly every April. On the other hand, on January 6th, 1906, I saw a flock of at least forty or fifty of this species, near a pool of water, on the southern side of the island of St. Thomas. There can be no question about the identity of the species, because I shot and skinned one to make certain. Possibly these birds were migrants from South Carolina and Georgia.

Two other migrants may be cited in the case of the kingfisher and the great blue heron; and it is interesting to note, again, how much at home both these birds seem to be in localities which are purely marine, and in which there is no possibility of their procuring sustenance from fresh water sources. Thus I have seen this kingfisher in the Testigos, Blanquilla, Swan Island and the Cayman Islands, none of which contain any permanent fresh water streams, and where it is in the habit of fishing regularly along the shores in salt water.

On our first visit to the island, in April, 1906, we saw several examples of another species of large tyrant-bird, with bright yellow under-parts. Unfortunately, thinking we should have time later in the day and that the bird was common, we neglected to shoot any specimens for identification; but, as far as one can be certain of anything, this bird was almost certainly the melancholy tyrant † (*T. melancholicus*). On two subsequent visits to the

*"Birds of Jamaica."

†Mr. Cory (Field Museum of Nat. Hist., Ornith. Series, Publication No. 137, Oct. 1909, Vol. 1. No. 5) records one example of this species as having been found on the Island of Curagao on May 1st, 1908. It had not previously been recorded from the island.

island we never saw a sign of it. This bird inhabits the mainland, ninety miles to the south; and we should not have mentioned it except for the sake of calling attention to this possible instance of a migratory, or wandering, instinct, similar to that of the humming-bird mentioned above; and also to the bad policy, when one is exploring new ground, of "putting off" shooting examples of a bird, because they seem common. "Never leave rising fish" is a good practical adage; and so, when collecting birds in a new district, never "hurry on" to ground which you *think* may be more interesting, until you have thoroughly "made good" the immediate ground you are working.

The parrot, which I have before referred to as occurring on Blanquilla, was interesting for two reasons at least. One reason was, that it came as a great surprise to us to meet with one at all on such a barren island; the second, that having obtained a sufficient number to form a series for comparison, it proved very difficult to determine to what species it should be referred; if, indeed, it could be referred to any, and was not sufficiently distinct to merit a new name of its own.* It would be tedious for the general reader to enter into too much detail; but briefly put, it is a green parrot with a yellow face and head, and with scarlet red markings at the bend of the wings. While in some respects it is similar to the parrot found on the mainland (*Chrysotis ochroptera*), in others, it appears to be more closely allied to a parrot which Dr. Hartert found on the island of Bonaire, some two hundred and fifty miles to the west; and which he named *C. rothschildi* after Mr. Walter Rothschild. As, however, hardly any two specimens, taken on Blanquilla, exactly agree as to their markings, it has been a very difficult question to decide, to which of these two species the Blanquilla parrot should be referred.

* Hartert, Ibis, 1893, pp. 123-328. *Bonaire Parrot*. Lowe, Ibis, 1907, p. 117; Idem, 1907, p. 304. *Blanquilla Parrot*. Cory, *Birds of Leeward Islands*. Field Museum of Nat. Hist. Publ. No. 138, Vol. I. No. 5.

Why parrots should have established themselves on Blanquilla at all, has always remained a mystery for us; for the only attractions which we could discover, though doubtless there are many others, were the small yellow fruit-like seeds of some guaiacum trees and the fruits of the cactus. Numbers of these trees grew in a woodland belt, situated along the whole length of the eastern side of the island; and here it was that in January we met with any number of parrots; numbers which exceeded, out of all proportion, anything which we have ever seen in any of the West Indian or Venezuelan islands. The only locality, indeed (confining our remarks to islands alone,) in which we have seen anything approaching such quantities, was in the western end of Margarita Island. Curious as this seems, however, the converse state of things on the Island of Grenada easily beats it. On this island alone of all the larger islands of the Windward group is no parrot found, and there is no reason to suppose that one ever existed there. It is one of the most luxuriant islands in the West Indies.

One morning, being anxious to obtain a good series of the Blanquilla parrot, for comparison with neighbouring species, we left the yacht while it was still dark, and made our way up to this long belt of trees. As soon as the sun had risen, the distant cries of the parrots, as they flew from tree to tree, came floating over the dense scrub; and having once worked our way into the neighbourhood where they were feeding, it was the work of a very little time to find several large flocks, and to shoot a sufficiently large number for our purpose. Like other parrots, they were almost invariably seen in pairs, and observed this constancy, even when as many as forty or more were flying together. By reason of this fidelity, shooting parrots is far from being a task one would willingly undertake, except for some very definite object; for once or twice when a bird fell, it was instantly followed in its fall by its companion, which circled round and round

it, uttering cries which made us feel heartily sick of what really seemed a most foul deed. One may try and comfort oneself with the reflection that many birds which pair for life, on being deprived of a mate, have been known to take another within a few hours, but I doubt if it is really much comfort at the time.

On this occasion we must have seen several hundred parrots, and if so disposed could have shot a dozen or more. To see so many on this morning was rather a surprise; for on a former visit to the island, four of us spent nearly the whole day dragging our weary limbs through the thorny scrub, with the sole idea of tracking down these birds, and we did not succeed in getting a single specimen, or in seeing more than a dozen or so. Seeing that this belt of thick trees, perhaps a mile wide and four long, is the only place on the island where the parrots are found, it seemed difficult to believe that we could possibly have missed them if many more had been present, for one can certainly hear their cries a mile away, even on level ground, as this was. The only explanation we can suggest for their occasional absence (and this occasion was not the only one) is that the parrots sometimes make expeditions to the island of Margarita, the western end of which lies forty-six miles away to the southward.

The occasion which I have just quoted, when we found so few parrots, was in February, during a second flying visit to the island; and this wood was then alive with mocking birds, which were in full song and beginning to nest. A note in my diary states that "the song of this mocking bird is as melodious as any other species I have heard." To wander in this wood under these circumstances at break of day, when the still air was all vibrant and tremulous with their liquid notes of love, was an experience not soon to be forgotten. The presence of such numbers of mocking birds on such a waterless island seems curious; but a possible explanation seemed to be the vast numbers of a land-snail (*Drymæus elongatus*), which

simply swarmed on the low aromatic bushes growing beneath the trees, and indeed all over the island.

On leaving Blanquilla after this February visit we went straight to Guanica, on the southern coast of Puerto Rico, arriving there after about a twelve hours' passage. Some bush country in the neighbourhood was swarming with another species of mocking bird (*Mimus polyglottus*), but although this island is only about a hundred and twenty miles to the north of Blanquilla, a note in my diary states that this bird "was not in song or apparently paired."

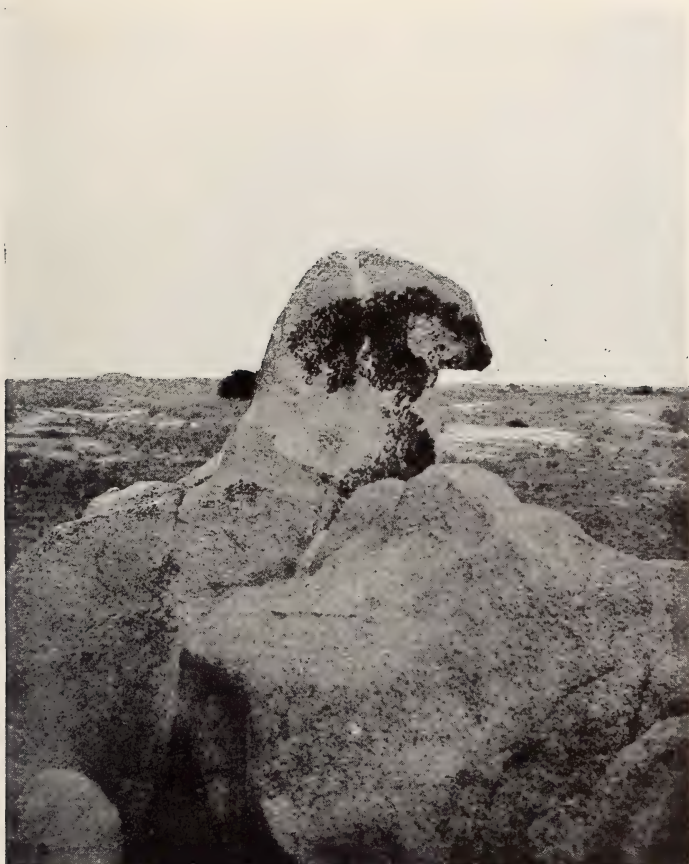
CHAPTER III.

WE ARE SUSPECTED OF GUN-RUNNING.

ONE morning, the uneventful tenour and the peaceful privacy of our little island received a rude shock ; and the shock caused us nearly as much surprise as the advent of the cannibals must have done to Robinson Crusoe.

We were returning from an early visit to the parrot wood, with collecting bags laden with spoil, and had just reached the top of the ridge, whence the ground slopes gradually down to the southern coast. From here, one's eye could rove east and west along the whole extent of shore-line ; where rock-bound promontories alternated with the broad sweep of sand-fringed bays ; and where, ever and anon, the vivid green of mangrove swamps spreads inwards to the land like some invading cancer. Right and left of us, the ground swept away in undulating folds or gently sculptured valleys, where cactus and mimosa scrub struggled for the mastery. Dotted here and there were huge heaps of granite boulders, looking as if they had been dumped down by some Cyclopean hand.

No faintest indication of human habitation marred the peculiar charm of this wild island picture ; where for ages wind and rain have striven to soften down the asperities of Nature and to prepare the way for a richer vegetation struggling to assert itself. Before us lay the Caribbean, stretching away to the south, where it was lost in the infinite blue of the sky. Beneath us was our little cove, where the masts of the yacht showed up above the green of the manchineel trees.



BLANQUILLA—WEATHERED GRANITE—EFFECTS OF TRADE-WIND ACTION.

[To face page 170.]

We had often stopped to look around us here and admire the wild beauty of it all ; but this morning the spell has been broken, the charm of its seclusion and privacy has been rudely shattered. There is a fly in our ointment : for a dirty little black Venezuelan gun-boat, ill kempt and ill conditioned, is steaming backwards and forwards just outside our own private little cove.

It is, of course, as plain as daylight what she has come for. We see it all in a flash, and are immensely tickled at the thought. We are suspects—the Venezuelan government is doubtful of our bona-fides, and has sent a warship to look us up, and see what our little game is, on this “tight” little island. They have never heard of *Chrysotis rothschildi* ; and if they had, they would not believe for a second that this puzzling parrot was the only *raison d’être* of our being here. Of course we are suspected—a man who gets rich so quickly, at his country’s expense, as President Castro, has good reasons to suspect much.

First we had been to the Testigos Islands ; a place no Venezuelan would dream that any one would visit, without some much deeper motive than we had. Then no one had landed at Cumana, where we had only stayed just long enough to send a boat on shore to get our “ papers ” made out.

After this, we had gone posting off, helter skelter, to the Laguna del Obispo ; a still more outlandish place ; and from here, after the briefest stay, we had hurried on to the top end of the gulf of Cariaco, where doubtless we had gone to meet and conspire with confederates. From here we had rushed away to Blanquilla—all quite the most inexplicable manœuvres on the part of an innocent yachting party.

Clearly we were up to no good. What was it ? Were we trying to run contraband, or looking for hidden treasure ?—or, by the powers !—that’s it—they’re landing arms and ammunition for the faction who are plotting against the government. Later on, when opportunity offers, these malcontents will quietly slip over and dig them

up—and then—Prenez garde à vous, Monsieur Castro. The country is seething with discontent ; the government is getting “jumpy” ; plots are hatching everywhere like turtles’ eggs in the sand. So here was the little gun-boat, sent over to see that we were not getting into mischief.

As we scanned through our glasses the ugly little vessel, so cranky and so top heavy, we felt the weight of the parrots in the bag, slung over our shoulders, and laughed again to think they had been the indirect cause of a warship steaming so many miles and burning such a quantity of expensive coal. Probably no series of parrots of one species has ever been the innocent cause of the expenditure of so much money.

But what a beautiful little plot it might have been ; and how neatly we should have been caught ! It seemed almost a pity it wasn’t all true.

Coming down the cactus-strewn slopes, we had just reached the little path which goes winding along the coast, when we came upon a landing party from the gun-boat, who apparently had lost no time in getting ashore. They all carried rifles, cartridge belts and side arms ; and one of their number, apparently a warrant officer, carried a sword. The plot seemed to be thickening—what were we to do ? A Venezuelan prison did not seem at all an inviting place on this bright sunny day. Should we, as the Americans say, “run for the tall timber, or fall for it ?” There was no tall timber in sight ; and to fall here, among this wilderness of cactus, was worse than going to prison ; so we held on, confident that the parrots, if occasion arose, would pull us through.

But apparently, this somewhat alarming posse of men have no orders to arrest us ; for after the exchange of the most punctilious of salutations and much doffing of hats, the following short and rather one-sided conversation takes place :

D. “Buenas dias, Senores—a fine morning—you are taking an early walk.”

One of the Senores : " Yes, yes, Senor—good day go walking."

This man looked a genial sort of ruffian ; and accompanied his remark with a wink, that might have been interpreted into the modern and expressive " not 'alf."

D. " Ah ! you talk English—bueno—would it be indiscreet, then, to ask you where you are going so early ?"

S. " To the ranche on the other side of the island, senor."

D. " But you are going in exactly the opposite direction."

S. " Quien sabe, senor ? " (who knows?) with a shrug and another grin. " One way as good as another."

D. " And then, too, there is a better anchorage on that side of the island. Do you always land here to go to the ranche, or does your captain like to give you a little exercise ? "

S. " Si, si, senor, much good walking," with another broad smile.

D. " Well, Senores, we must not keep you ; for you will have a warm and prickly walk, and the sun is already high. We hope you will have good sport on the way, for I see you are going shooting and are well prepared."

S. " Si, si, senor, muchos pajaros en esta isla."

D. " Yes, yes, so we have found—a good many birds on the island—you are right—but surely you have rather powerful looking weapons for such small game. But stay—now we come to think of it, we remember to have seen some *fieras* among the rocks (some wild cats, which was a fact) : can it be that you are going on a wild-cat chase ? "

But this is too much for our genial friend, who laughs and smiles so good-naturedly, to the evident annoyance of the rest of the party, who apparently have not understood a word of our conversation, that I hand him the only two cigars I have left, one of which he lights with a profusion of thanks and more smiles. And so with more

punctilios and adios we say goodbye, and both parties continue on their way.

Arrived on board the yacht, we learn that the commander of the gun-boat has paid us a visit himself, and has asked to see our papers, besides asking a thousand questions. Offers of hospitality, in the shape of light refreshment, were rather curtly declined, and our suspicious visitor goes over the side more mystified than ever; while a minute later the gun-boat starts away for the other side of the island.

That night, while all slept peacefully on board the yacht, and one of us dreamt of finding an unique species of parrot, which was the envy of the whole ornithological world; an armed party of men from the gun-boat marched over from the ranche and watched through the long hours, in the trees, at the head of our little cove. Our anchor-watch could see them now and then as they struck a light, in a vain endeavour to keep off the mosquitoes by smoking. What they saw we do not know—certainly no party stealing ashore to dig holes in which to bury arms or secrete contraband; but if the sand-flies are only twice as bad at night as they are here in the daytime, these poor fellows must have spent an unhappy time indeed, and this is saying nothing at all about the mosquitoes.

Dear little peaceful Zenaïda cove—by which name our captain christened you, and duly entered you in the log—what curious expressions you must have listened to all through that long hot night; so very different, we imagine, from the silvery-toned accents of the sea-nymphs when they come ashore to rest on your rocks, tired of disporting themselves among the “white horses” outside. Perhaps they sometimes whisper to you of the beautiful coral gardens they visit down below; of the angel and the peacock fish they know so well; of the lovely mauve coloured beds of waving sea-fans, and the long stalked, flower-like crinoids; but surely you have never listened to such strange language as you heard that night, when

the mosquitoes gathered from far and wide to that delicious banquet of sultry Venezuelan blood.

The series of parrots which caused all this fuss and discomfort now repose peacefully side by side in a cabinet in the British Museum of Natural History. Perhaps some day in the future, some one writing a paper will compare them with another series of parrots from some other island or locality. He will measure them, may be, with painful accuracy, with a measure ruled off in millimetres, describing in still more painful detail their various peculiarities and points of difference as regards other species. He will fumble with them for a time, making an occasional note, throwing them down here and there upon the table, or tossing them nonchalantly across it, to some other enthusiast, who, being employed on quite another region of the world, will probably be very faintly interested; and as a result of it all, this parrot will be raised, may be, to the dignity of figuring as a new species or sub-species, and the fact will be published in the "Ibis."

But for this man, or anyone else who chances to examine them, they will be mere "skins." And can dry "skins" speak? Can they mean anything more than a mere arrangement of feathers, except to him who collected them? Will he ever suspect what the series cost in mere Venezuelan coal, in Venezuelan blood, and in the wear and tear of rusty Venezuelan machinery?

Will he ever have heard, as we can now, the shrill discordant cries of a far-away flock of parrots, as they greet the morning sun, rising like a red ball of fire from its bed in the Caribbean Sea? Will he ever have listened to their strange conversational call-notes, as they fly by in a big flock, but all in pairs; and the sun, scarcely half an hour high, shines full upon their flanks, making them gloriously and brilliantly green? Will he ever know what it means to wander in the woods of a small and lonely Caribbean island and watch the day begin in the first cool hour of a tropical morning?

And lastly, will he ever know what it means to get up early, climb to the woods, shoot eight parrots, and come home hot and perspiring, to sit down and skin them ?

We wonder ! But we can hardly think that the chance sight of other "skins" in some one else's collection ; or the chance note of a bird, caged or otherwise ; or the chance remark of a friend, have not had the power, at some time or other, to strike some such chord of pleasant recollections of past experiences and oft-remembered sights : for if they haven't, his ornithology, with all its array of marshalled facts, must be to him as meat without salt.

CHAPTER IV.

SOME FEATURES OF BLANQUILLA—ANIMAL, VEGETABLE AND GEOLOGICAL.

THERE must be some hundreds of goats, and scores of donkeys on Blanquilla; and among them we saw also a few mules and even horses. They have the free run of the island, over which they roam in complete freedom, and we met them in the thickest of the woods, where they breed in undisturbed peace. Some of the young donkeys were beautiful little creatures, living as they did in practically a wild state, and one could not help thinking that this island would furnish a most ideal spot for conducting experiments in the crossing of donkeys and zebras or such like breeds.

We were informed that the rent paid for the island to the Venezuelan Government amounted to the equivalent of about £70 a year. How long goats have lived here, I cannot say; but Dampier, in 1682, relates that he found none, although there were reported to be some, and he with his buccaneer crew visited the island with the evident intention of procuring some for meat. It would, however, be more interesting to be able to trace the inevitable effect which these animals have exercised on the vegetation and appearance of the island.

The flesh of all these goats is cured in the South American fashion, and packed, ready for shipment, from time to time, in some sheds, which have been erected near the ranche owner's homestead. It is carried across to the mainland in a schooner, which is managed by his

sons. These people are, in fact, really nothing more than modern buccaneers, for although they do not "boucan" their meat in the original style, yet the result is much the same, even if their aim and object is more peaceful. Here also, we saw huge piles of bones stacked in heaps, presumably ready for transportation to the mainland, where they would be ground up for manure; and also numbers of turtle shells, the flesh of which is cured and packed in large jars. Judging from the number of their shells, this last industry forms no small part of the owner's profits.

Dampier writes in his quaint way of the large numbers of green turtle which visited the island in his time.

"There is sandy Bays," he observes, "round the Island, where Turtle or Tortoise come up in great abundance, going ashore in the night. These that frequent this Island are called green Turtle, and they are the best of that sort, both for largeness and sweetness, of any in all the West Indies."

Again, further on in his "Voyages" he writes: "I have observed that at Blanco (Blanquilla), in the West Indies, the Green Turtle * (which is the only kind there) are larger than any other in the North Sea. There they will commonly weigh 280 or 300 Pound; their Fat is yellow and the Lean white, and their flesh extraordinary sweet." As no one, as far as I am aware, has had anything to say about this island since Dampier's visit to it in 1682, I may be excused for again quoting parts of his description taken from his "Voyages." "It is a flat, even, low, uninhabited Island, dry and healthy; most Savannah of long grass, and hath some Trees of *Lignum Vitæ* growing in spots, with shrubby bushes of other Wood about them.

"It is plentifully stored with Guanoses † which are an Animal like a Lizard, but much bigger.

* *Chelone mydas*.

† *Iguanas*.

“ The body is as big as the small of a man's Leg, and from the hind quarter the Tail grows tapering to the end, which is very small.

“ If a Man takes hold of the tail, except very near the hindquarter, it will part and break off in one of the Joints, and the Guano will get away. They lay Eggs, as most of those Amphibious creatures do, and are very good to eat. Their flesh is much esteemed by Privateers, who commonly dress them for their sick Men ; for they make very good Broath. . . . The Road is on the N.W. end, against a small cove or little sandy Bay. There is no riding anywhere else, for it is deep water and steep close to the Land. There is one small spring on the West side, and there is sandy Bays round the Island (*where the Turtles landed*). . . .some of our modern Descriptions * speak of Goats on the Island. I know not what there may have been formerly, but there are none now to my certain knowledge ; for myself and many more of our Crew have been all over it. . . . We staid at the Isle of Blanco not above ten days.”

Blanquilla still swarms with iguanas. They are of a very dark colour, some being almost black. Every little coppice contains at least four or five of them, which on the approach of an intruder remain absolutely motionless in the branches. If seriously alarmed, they either fell plumb to the ground or scrambled down the tree, and then scuttled off with tails held erect, as hard as they could go for their holes, which were generally situated some yards away in the open. From independent researches conducted by the sailors, I am inclined to think that Dampier is correct in stating that when an iguana attempts to escape in this manner, its tail, when suddenly grasped, is liable to come off.

These iguanas made nothing of climbing the very tall tree-like cactuses (*Cereus*) which grew among the acacias and guaiacum trees in every little coppice. Over and over again we saw them resting on a perfect chevaux-de-frise

* Probably “ The English Pilot,” published in 17th century.

of horrible spiny points, which, however, did not seem to worry them in the least.

It is rather strange that so observant a man as Dampier has nothing to say about the cactus, either here or in other islands, like "Querisao" (Curaçao), which he visited; for one would have supposed that they could not fail to have made an impression both on the imaginations and the flesh of these old-time sea-pirates; and, incidentally, to have been the cause of many lurid expressions on their part. Possibly the explanation is that there were not nearly so many in Dampier's day as now; for we must remember that since those times, goats, donkeys and cattle have been working their wicked will on almost every form of vegetation within reach, *except* the cactus, and a few plants like the lantana, the thorny acacias, log-wood, and the tough leaved xerophytic plants in general, which know how to protect themselves. Consequently the cacti and these other trees and plants have been in the position of the "favoured nations," and have flourished superabundantly. Moreover, the spiny segments of the cacti, catching in the hairy coats of the goats, have been carried and disseminated to every part of the island.

Perhaps, on the other hand, the skin of these buccaneers was as hardened and immune to pricks as their consciences, and the cactus did not trouble them. It is all the more curious as Dampier mentions the occurrence of *lignum vitæ* or the guaiacum tree (*Guaiacum officinalis*), for this is by no means a conspicuous or noticeable tree, although quite common on the island, and by the ordinary observer would be passed by without attracting attention.

Dampier, being a sailor first and then a naturalist, and an acute observer, may have learnt to recognise it; for among the uses to which it is put is that of making ships' blocks. It is also held in great esteem for making rulers, bowls, the handles of carpenters' tools and for turnery; while the resin which it exudes is made use of in chronic rheumatism and gouty affections. On Blanquilla it grows in a rather stunted fashion, and together with a

species of acacia (*Pithecolobium dulce*) forms a distinctive feature in the landscape. Its smooth, oval and rather shiny leaves, which grow in pairs, and its small clusters of pale blue flowers render it easy of recognition, if looked for. Its wood, besides being very heavy and not floating in water, is remarkable for exhibiting hardly any trace of annual rings, and for the direction of its fibres, each layer of which crosses the last in a diagonal fashion. There is probably little doubt that its seeds were originally introduced to the island by means of parrots.

The long belt of woodland, where we found the parrots, and which contains a great number of these guaiacum or lignum vitæ trees, forms rather a striking feature of Blanquilla; and the explanation of its existence seems to be worth noting. Seen from the central plateau of the island, it begins as abruptly and is as well defined as if it had been planted by the hand of man, stretching away north and south, along nearly the whole eastern edge of the island, like some long wood or plantation which marks the boundary of a large estate. Except for the small isolated coppices, a few square yards in area, which have been mentioned before as dotting the surface of the high ground in the central parts of Blanquilla, there is not a tree to be seen there; so that the contrasts between this artificial looking plantation and the arid stretch of barren wilderness had struck us as being most peculiar.

The peculiarity was all the more marked, since the belt of forest sprang from ground which was on exactly the same level as the rest of the central plateau, with absolutely nothing, as seen from a distance, to mark the existence of any different geological formation, or the presence of any obvious cause favouring the growth of trees. Yet a different formation there proved to be, and one which explained at a glance this curious belt of vegetation: for on entering the wood we passed immediately, almost stepped, in fact, from a granite formation to a nearly bare coral limestone rock, which rang and clinked under

our iron-shod feet like metal. Every here and there, one came across small areas and pockets of good-looking soil ; but for the most part the bare rock was either jagged and rough, making an abominable surface to walk on, or was as flat and smooth as a pavement. Yet trees, bushes, and even flowering plants, flourished on it to an extent out of all proportion to those found anywhere else on the island.

These smooth level surfaces of coral limestone, exhibited everywhere an obvious organic structure, with perfectly distinct remnants of the original reef builders ; so that it was quite evident that we were walking on a comparatively very recently upraised coral fringing-reef. This reef, as far as we had time to trace it, stretches as a dead level platform, at an elevation of about two hundred feet above the sea, and is of a varying breadth of a mile or less. It extends all along the eastern (windward) side of the island ; but towards its southern border, it ceases abruptly within about half a mile from the sea, between which and the edge of the platform, the ground slopes rapidly down, and is occupied by an undulating surface of much-weathered granite, covered with a thick growth of cactus of several varieties (*Cereus*, *Echinocactus*, *Melocactus*, *Opuntias*, etc.)

Some of the trees which we noticed growing on this platform of coral were of quite respectable growth, attaining to a height of sixty feet or more ; but for the most part, it was covered with a thick bushy growth of acacias and guaiacum. As far as we could judge, without any means of forming anything but a guess, the height of the reef above the sea must be nearly two hundred feet, that is to say, practically the same height as the central plateau, which again is the highest part of the island.

A glance at the accompanying plan of the island, enlarged from a chart and slightly corrected according to the findings of the yacht's officers, will give the reader a rough idea of the situation and extent of this capping of coral formation, and its relation to the rest of the granite



GRANITE CLIFF WITH OVERLYING CORAL—BLANQUILLA—SOUTH COAST.

[To face page 183.]

structure of the island. All along the south side of the island there is also a slight fringe of coral, which caps the granite but never extends inland for more than a few yards.

The accompanying photograph shews an admirable section taken on the south side of the island, near our landing place, of the granite below, and the coral overlying it in a capping about six feet deep. As far as we were able to observe, there was not the slightest trace of coral along the western shore of the island, which was distinguished by sandy beaches and low dunes, and it is worthy of mention that it was on this side, at a spot where the soil seemed of a more clayey or sandstone nature, that we one day came upon the only natural pool or spring of fresh water. There were also some fairly extensive brackish ponds in this neighbourhood, which had been formed between the sand dunes and the grass-covered granite slopes inland.

Round the muddy margins of these pools some waders were busy feeding; and we noticed a large blue-heron (*Ardea herodias*) and a kingfisher (*Ceryle alcyon*); while in some thick mimosa scrub near by, we missed securing one of the only two examples seen during our visits to the island of a very beautiful dove. These doves belonged to the genus *Zenaida*, with which pretty name Sir Frederic Johnstone had christened the yacht in which we visited Blanquilla.

From what has been said above as to the position of the old coral reef and its structure, it would seem highly probable that, geologically speaking, Blanquilla has only recently been upheaved from the sea, although its foundations consist of the most ancient types of rock (*Precambrian*).

Close upon one hundred and eighty miles nearly due east of it, lies the island of Grenada; and to the north of this, the three islands of Martinique, St. Lucia and St. Vincent are distant from Blanquilla some two hundred and forty miles in a north-easterly direction.

That is to say, these islands are so situated in regard to the Trade-winds and currents, that the seeds of trees and plants, along with other vegetable flotsam, would be driven from them to Blanquilla as along a well beaten track.

It would seem, therefore, as if an examination of the floral contents of the long belt of wooded country, which we have already described, might furnish an engrossing study for the botanist interested in the oversea transportation and origin of an island vegetation; for when Blanquilla first "shewed its nose" above the water, it seems to us that it must have done so in some such form and shape as the green portion of our rough map. That is to say, it probably first appeared as a flat elongated and slightly curved coral reef, which had gradually grown upwards to the surface from a submarine foundation of granite.

We have thought it worth while to dwell at some length on the description of this coral platform, because in the two small island groups known as the Los Roques and the Los Aves islets, which are situated respectively one hundred and twenty and one hundred and eighty miles almost due west of Blanquilla, we probably have two good examples illustrating at the present day the mode of origin of Blanquilla.

The Aves group, which will always remain famous as being the scene of the wreck of an entire French fleet under Admiral D'Etrees in 1678, consists of two main divisions—a westerly known as Ave de Sotavento and an easterly as Ave de Barlovento. Both these divisions are mere coral reefs, about twelve miles apart, which consist of numerous small and low cays or islets (the largest three and a half miles long), covered with deposits of phosphate and sand. In the largest of these islets there is a big salt water lagoon. Ludwig * states that the flora is extremely scanty, consisting of mangrove trees

* "Globus" Die Inseln vor der Nordküste von Venezuela, September, 1898.

and a few low shrubby bushes, in addition to sedums, grasses (*Carex*) and a salt-loving plant of a sprawling habit and with a salty juice (probably a species of samphire or salicornia). Fish abound among the reefs, which are also frequented by turtle, while the rest of the natural population is made up of boobies (*S. leucogastra*) flamingoes, herons (Ludwig saw four different species), curlews, yellow-shanks, plovers, turnstones and other shore birds.

The Los Roques group also consists of a mass of flat coral islets which occupy a space of fourteen miles in a north and south direction, and twenty-four from east to west. The description, which we have just given, of the Aves islands would apply almost equally well to this group, except that in the northern extremity of the group there is an islet called El Roque, which rises to a height of several hundred feet, and is visible as a high cone-shaped mass at a good distance out at sea. On one of our cruises we passed it at a distance of about ten miles, and as the other low cays were invisible from so far away, the effect of this pyramid of rock, rising lone and grey from the sea, was very strange. This high rocky islet differs from all the rest of the groups in consisting, as far as one can understand Ludwig's description (*loc. cit.*), of a medley of various forms of Archæan schists and rocks which trend in a south-west to north-easterly direction. On the east and south sides are found some crystalline Archæan limestones, while the main mass contains varieties of granite such as biotite and diorite, and in addition he found augite and greenstone-schists.

Hence one may conclude that both these groups of islands have been simply formed by coral reefs which have grown upwards to the surface from a submarine plateau of Archæan rocks.

With the exception of the island of El Roque, which probably has resulted from some more violent upthrust as the consequence of vast pressure beneath, we may look upon both groups of islands as representing a stage of

evolution comparable to that of Blanquilla, when the coral platform noted above had just emerged above the surrounding sea.

At this time we can picture this long and low reef covered with the first vegetable immigrants to gain a footing on it, and inhabited by a teeming population of flamingoes, boobies, pelicans, frigate-birds, terns, and shore-birds, while no doubt vast numbers of turtles would have resorted to it to lay their eggs.

How interesting, therefore, it would be, if we are correct, to compile an exact inventory of the flora of this belt of trees which now grows on the old upraised reef, and to compare it with that of the West Indian islands and the mainland adjoining. The ancestors of everything growing on it must have been originally transported by means of ocean currents, winds or birds. We seem to see these vegetable invaders drawn up along the windward side of the island like the long lines of an invading army. They have effected a landing, and have seized upon the only strip of coral territory which could afford them support. They have extended their operation to the very uttermost limits of this territory and then have stopped short, suddenly brought up by the question of "supply," and utterly non-plussed at the harsh, hungry and bare gneiss facing them beyond, and which said in effect, "Thus far shalt thou come and no further."

Like the Danes, who invaded our own eastern shores in days gone by, these vegetable invaders have arrived from over the sea; like the Danes they have swooped down upon everything they could lay their hands on; but like them, too, they have never been able to push their advantage beyond a certain distance inland. Which of all the many forms of West Indian vegetation have been able to gain a footing here, and having gained it have been able to keep it?

PART III.—THE HERMANOS ISLANDS.

CHAPTER I.

HIDDEN TREASURE.

NINETY miles due north from the coast of Venezuela, and forty from the north-western point of Margarita Island, seven lonely islets rise sheer and steep from the depths of the sea. In the language understood by the English sailor they go by the name of "The Seven Brothers."

No one lives on them ; no one ever seems to have heard of them ; there are no signs that anyone ever visits them. Except for the sea-birds, which nest there and return daily to roost from their fishing excursions, and the few—very few—land-birds and animals which, like hardy adventurers, have wandered and settled there by accident, there is nothing to break the silence which endures from year's end to year's end among their massive piles of cactus-strewn granite.

For all we know, no human voice had broken this silence since Ludwig, a German geologist, paid a very hasty visit to them in 1883. Beyond mentioning that the islets consist of eruptive rocks, apparently of the nature of diabase, and that boobies and a small black and white gull ("möwe"—probably the sooty tern), as well as a smaller, black sort (? a shearwater or a noddy), are very plentiful on one of the group, called Pico, Ludwig had practically nothing to say about them. We saw nothing of either of these two birds, whatever they may have been, on the particular island we explored, but it is

quite possible that at another season of the year they may visit the group to breed.*

Situated on the extreme northernmost edge of the shallow submarine shelf, which extends a varying distance from the mainland, "The Seven Brothers" form, so to speak, another link in the chain of islands standing like outposts along the frontier of a great continent.

Immediately to their north, the submarine plateau from which they rise sinks deeply and suddenly down to a depth of five hundred fathoms, and from that, almost precipitously, and in giant steps, to depths of 1,000, 1,500 and 2,000 fathoms, until in little more than twenty miles in a north-westerly direction, the abysmal depth of over 2,500 fathoms is attained in the marine depression which goes by the name of the Puerto Rico Basin (*see map*). Consequently, if we could imagine this basin drained of all water, and ourselves standing at the bottom of it, looking southwards, we should see before us a long barrier chain of mountains rising steeply to a height of 15,000 feet, and in one culminating spot, seven little isolated peaks rising in a group to another five or six hundred feet. There is, in fact, reason to suppose that in a past geological age one could have done this in actuality, as we try to do it now in imagination; but this was when the land had probably risen on such a vast scale that the Caribbean basin was very nearly a dry plain sloping to the west.†

Now, like buoys which mark that something has been sunk below, these islets, mere relics of ancient land, shew their heads above the water. Like sentinels, they stand in lonely isolation, outposts of a great land, exposed to the full force of the Trade-winds and the fretful Caribbean

* Since our visit, Mr. Ferry on behalf of the Field Museum of Natural History, Chicago, found both the Sooty Tern and the Noddy Tern breeding on the island in February, 1909. ("Birds of the Leeward Islands, Caribbean Sea," Field Mus. Nat. Hist. No. 137, by Chas. B. Cory).

† Spencer, "Reconstruction of the Antillian Continent," Bull. Geol. Soc. Amer., vol. vi., pp. 103-140.

Sea, which dashes itself in impotent fury against their granite walls.

With such "reflections" the "West India Pilot," which contains the only other reference to the islets we have seen, concerns itself not at all. It dismisses them with the following almost curt remarks: "A group of seven wooded islets, known as the Hermanos, which occupy a space of eight miles in a N.N.W. and opposite direction. The three southernmost (the northernmost of which is named Pico, five hundred and seventy feet high) lie close together, and are separated from the others by a clear channel three miles wide. The southernmost of the remaining four is named Orquilla; this is the largest, and about six hundred and fifty feet high. Most of them are high, bluff, conical rocks—they are all steep to, but no soundings have been noted in the passages between them."

* * * *

From the wooded eastern sides of Blanquilla we first looked across the intervening ten miles of open water, to see these islands rising stunt from the sea—mysterious and alluring—like so many pyramids covered with a soft green mantle of vegetation, dimly seen through a misty blue haze.

We were lying in the woods, stretched at full length, under the welcome shade of a guaiacum tree, after a hard morning's tramp in search of birds. Tired and sleepy from the intense heat and the long walk, we were listlessly munching our sandwiches, eking out the last few drops of refreshment in the water bottles, and gazing dreamily across at these mysterious witnesses of a bygone geological age. Strangely fascinating they appeared, seeming to beckon to us to come and explore the secrets they held; seeming, somehow, to wear an aspect of wild romance, and almost to be speaking to us of those long-past adventurous days, when the old sea-robbers roamed this sea at their own free, dare-devil wills.

A host of sea-captains, whose names once struck terror wherever they sailed, must have passed by these wild and lonely piles of granite, and marked them down as likely enough spots to hide their booty. Drake, and Raleigh, and Duddeley, bowling down to the Spanish main with the fair Trade-winds, had perhaps looked upon them. Dampier, Swan, and the never-to-be-forgotten Morgan, had almost certainly done so.

There is a belief, and we had heard of it as far away as the Bermudas, that these islets do indeed contain hidden treasure; but whether true or not, no islands could be more suggestive of this ever-fascinating craze. Surely, somewhere among those boulders and cactus-strewn declivities, rich spoil must be lying—heavily iron-clasped boxes, mouldering slowly away in the hot dry deposits of phosphate, and full of Spanish doubloons, jewel-studded chalices and priceless treasures from looted churches. Iguanas have basked for generations, in undisturbed possession of the hot dry rocks, which alone mark its resting place. Boobies in countless hundreds, have scraped out shallow nests in the mould which covers it. The “prickly pear” has long ago sent down its tough roots to grope and twist among the rich relics of Carthagera or Panama cathedrals.

The more we stared, the more convinced we felt, that such must needs be the case. No self-respecting pirate, anxious to play the game, could have possibly passed them by, without immediately seeing that these islands were simply made for him.

So in the blazing midday heat, we mused and pondered and gradually grew more sleepy. No one had spoken a word for at least ten minutes. My pipe seemed to have finally resolved to go out. There was a faint, languorous murmur of insects in the hot drowsy air; and I was beginning to wonder if whisky, after all, was a good thing to drink in the Tropics. Across the sunlit sea, the islets were dancing in the shimmering heat.

Beyond our tree a fierce light was beating pitilessly down upon the patient vegetation.

It was the time for sleep. The birds had given us the cue, and had sought the shelter of the deepest shade. Even the doves were feeling the drowsy influence of the midday hour and had stopped their plaintive cooing. From the dry stiff leaves, fallen from our tree, a lizard came rustling out, advancing stealthily with many a jerky, furtive little run, towards the outstretched legs of my already sleeping companions. In a dreamy, sleepy sort of way, I see it raise itself on its forelegs and turn its head in my direction. For a second or two it remains thus, galvanized into a position of strained and anxious suspicion. It has an eye of topaz, beady and glittering, like flashing gold. The sunlight filters down through the leaves, and falls upon its glistening coat of iridescent but invisible scales. It seems to hesitate, uncertain of its next move. It is in the presence of some utterly strange experience, and a rash step may be fatal. What is passing through that diminutive little brain, in the sleek pointed head?—if anything in the nature of incipient thought can be said to influence it. Can it be wondering, what these strange giant-like creatures are, who have sprawled themselves, without so much as a “by your leave,” all over the happy hunting ground, which it had always considered to be its own?

Lazily I flick a piece of sandwich in its direction, and like a flash it has whisked round and scuttled off through the dry rustling leaves . . . a gentle sound of snoring comes from the other side of the gnarled tree trunk; the drowsy silence is slowly having its effect; . . . my head seems to want some sort of support;—I half think that must have been my pipe which fell with such a crash among the leaves. Well! who cares? let it stay there.

* * * *

What's that you say?—a schooner! a black flag!! By the Holy Virgin yes! look at her; a likely looking craft enough, with a hull as black as night and lines as

clean as a new sheet. Holy Mother! how they crack her along!! By the saints, though, they'll have the sticks out of her. Look lads, look, she's making for "The Brothers"—see her lee-deck all awash—surely they must be hard pressed for it I rub my eyes and stare across the sparkling sea through the dancing mirage. Yes, there she is, sure enough!! A smother of creamy-white foam streams from her fine-cut stem—a black flag is fluttering wildly at the peak, and she heels over with a press of white canvas, making short work of the distance which separates her from the islands.

Presently, as we strain our eyes across the sea, we see her helm put up. Round comes her head right into the wind—all her sails a-shiver—and she shoots on awhile, towards a little cove under the lee of one of the islands.

A dinghy is swung overboard. We can see the splash it makes as it hits the water. Men are swarming to the rails. They are dragging a heavy, nail-studded box. They lower it over the side—others follow with picks and shovels. Some bronze-faced ruffians in a strange motley of many-coloured garments seize the oars. Some one else, evidently someone to be respected and dreaded, lightly drops into the stern and takes the tiller.

He steers for the little cove, where the swell gently rises and falls against the rocks. There is no place where they can beach the boat, so the men tumble out and feverishly haul the box ashore. Laboriously it is pulled up the sun-baked slabs of granite, all alive with iguanas and gannets. Sweating and growling at the leaden weight, they clamber up, stumbling amongst the loose rocks and cursing at the prickly growths of cactus. At last they find the very place. Breathlessly they begin to dig; and while the hole grows larger and deeper, the man who steered makes a careful plan of the surroundings, measuring the distance this way and that to prominent marks, which he jots down on a rough chart. Soon the box is lowered into its resting place, the soil is hurriedly shovelled back, and all traces of disturbance

carefully obliterated. A last look round ; another glance at the compass ; and then they all come slithering down the rough rocks, and once more tumble one by one into the boat, which a man is backing stern first towards the shore. Quickly they row back and scramble on board. The schooner's head falls off, and away she stands, once more, for the open sea and the main.

But in spite of all their feverish hurry they are *too late* ; and just because their luck is dead out they run smack into the King's ship which is on the look out for them. Barely have they cleared the islands before they see her. All her sails are drawing and bellying out before the stiff Trades. She is coming down with the wind going great guns ; and just as they clear the southernmost island, making eastwards, she clears the easternmost, making south-westerly.

Look, boys ! They're caught, fair as mice in a trap. Yes ! the King's men have got 'em. Why they haven't even a dog's chance to wear their schooner round and shew a clean pair of heels.

See ! there goes the red and white flag of St. George, fluttering up to the peak—a spurt of smoke comes from a gun in the bows, and a round shot goes crashing over the waves, across the front of the chase. It is answered with a wild defiant yell, and by every gun that can be brought to bear by a desperate crew.

It is enough ! down goes the warship's helm, men swarm to the sheets and braces. The ship heels over, as she comes round and shoots along on a parallel course to the schooner's, but with the weather gage. All her starboard broadside is brought to bear by the manœuvre—crash it comes—fearful and devastating. The sloop staggers on with shattered spars—outsailed and outmanœuvred. Crash comes another roar of guns as the King's ship forges far ahead. Presently down goes her helm again, bringing her up into the wind. For half a minute all her sails shake and shiver in the strong breeze. Then as they fill again, the warship comes

tearing back on the starboard tack. This time her port broadside barks forth its storm of death; there is a deafening report and a blinding flash on board the Buccaneer vessel as her powder magazine explodes and . . .

“Good-lord above! what was that?” “Where are we?” “Hullo, is that you, Barton?” “Yes, sir, we’ve just shot that bird you wanted. Had a rare chase after it though. Wheugh—isn’t it hot?”—“Merciful heavens, yes! but I thought you were all asleep. Why it’s four o’clock, and time we were moving.”

CHAPTER II.

A DIFFICULT LANDING.

It was barely light when we slipped quietly away from our anchorage in the little cove, which lies so snugly, under the lee of the south shore of Blanquilla.

Outside we found a stiff Trade blowing, which boded ill for our landing on Orquilla, the largest of the Hermanos group. The yacht curtseys and dances to the rising sea, for the islands lie straight to windward. Now and then she dips her nose fairly into it. For one brief moment, as she does so, a cloud of dazzling powdery spray caps our bows, and then scatters itself in a thin shower of salt spume, which rakes the forecastle deck from end to end.

Long before we have covered the ten miles of open sea, we have breakfasted, and are all ready for the stiff climbing which a day's bird collecting on these precipitous and rocky islets entails.

By the time we are near enough to examine them in detail, the ship's dinghy has been lowered to the rails, and loaded up with guns, collecting bags, cartridges, camera and lunch ; while near it, all ready for the fray, stand seven rather desperate-looking characters, arrayed in a varied assortment of sun-hats, thick boots, and home-made canvas putties, designed to withstand the deadly cactus—any sort of kit, in fact, that seems good in the owner's eyes. In addition we are provided with stout poles, ropes, machêtes for cutting a way through the cactus, knives, water-bottles and field-glasses.

By the time we get up to it, a stiff breeze is blowing down the channel which separates the two groups of islands ; and a tide like a mill race is running through it. To our right lies Pico, close upon six hundred feet high : a mile or more away upon our left, the waves are dashing in a white line of breakers on the southern side of Orquilla, which is another hundred feet higher, and roughly three miles long. It is the island we propose to explore. Between us and the tail end of it are some nasty tide-rips ; and it is pretty evident that we could hardly have chosen a worse day, and that we shall have a job to land.

We look across the riot of waters to where, in the dull grey of the morning, Orquilla rises grandly and supremely indifferent to it all—a towering mass of granite. Sphinx-like it rises from the sea, serene and tranquil, amid the turmoil of water raging at its feet. The fate of our little expedition is trembling in the balance.

“ Well, Captain, what do you think of it ? ” we say in rather an anxious tone. “ Eh, sir ?—well—I don’t now—may as well have a go at it anyway—you can but come back if it don’t look fit.” “ So we can, Captain ! Well ’ that’s good enough for us. Come on then, let’s fire away at once.”

Ting-a-ling. Ting-a-ling-ting-ting. “ Slow her down please, Mr. Mac.”

Half speed it is—quarter speed it is—and then way enough to keep her going against the tide. Quickly she loses her pace till we are barely moving ahead.

Now the time has come to lower the boat. The Captain turns to the man at the wheel : “ Starboard a little and give ’em the lee-side—*steady*.”

“ Steady it is, sir.” “ Now then—there’s no time to lose ”—sharp’s the word.

Quickly we run down the bridge ladder and gain the main deck, meeting Mr. Eagle, the first officer, who is hurrying along from aft. Short and sharp come his orders.



LANDING PARTY ON THE TOP OF ORQUILLA.

[To face page 198.]

“Look alive now, boys—away dinghy there.” “Lead that painter well forward—you.” “That’s right.”—“Lower away fore and aft: Easy there—keep her level.” “Now then, both ends together.” And with a rumble and creak of blocks down goes the boat, and lands with a scrunching crash in the sea. *Smack* comes a wave and breaks in a shower of spray over her bows.

“Sharp now—unhook them falls—after end first.”

“Right there!—dinghy in the water, sir!” Yes, by Jove! and lively, too, from all appearances!

“Now then, lads—over the side—no chance for gangways—tumble up there and jump in as she comes up—sharp’s the word.” Up she comes, and down she sinks again in the heavy swell. “Look out there!—keep her off—*keep her off*,” shouts the first officer as she surges up against the side—“Careful now.” Over the rail jump the men—one, two, three, four, dropping in like cats. “Any more?—all aboard—hold on—one more coming—tumble up then—jump for it, Bill—well done—let go that painter there—all gone, sir—Now then! give her a good shove off forward and give way together—that’s the style, lads—steady—*steady* there”—for the starboard men threaten to pull her broadside on—“Now then, give way.” And we are clear and well away at last.

Things are pretty lively, as we wave a goodbye to those watching us on board, and the moment we get well away from the lee of the ship they are worse still.

Now the boat climbs up a regular comber, as it comes seething and tearing along, with a tumbling head of white milky froth; and then down we go again on the other side, as it hisses harmlessly beneath us, and surges on its way.

Smack!—bang! comes another, and drenches the men in the bows; but it is chiefly spray, and our four stout oars go pulling away in the good old English fashion, while Gillam, the second mate, keeps her carefully head to sea and cries encouragement from the stern. We reach for the

guns to keep them dry, and nearly topple head first into Fuller, who is rowing stroke ; and then we gradually settle down to watch the white horses as they follow quickly, one after the other, and do their best to come aboard.

There is nothing so fine and exhilarating as this, if you want to realise what the sea really means. The sonorous surge of the waves is all about you, smiting on the brain and ear with a wild overmastering chant of elemental music. The wind blows cool and fresh and clean. It is *all* clean here. That is the feeling one gets—that and a sense of respect and awe and admiration, half love, half fear, for these great, irresistible, clean waves. They are playmates, but rough big playmates, to be humoured and coaxed ; full of fun, but anxious to shew us their strength.

“Hullo !” they seem to say, “come out of that big thing you call a ship, have you ? That’s right, now we meet on something like equal terms. Nice fresh morning for a frolic, eh ?—like to have a game with us ? What, no !—well take that anyway—sorry we can’t stop to apologise—must hurry on you know—it’s this confounded stiff Trade—oh ! never mind ; it’s only our fun—look out for big Ben though, he’s coming toppling along about six waves behind—always lagging like that—seems to have got into the habit of it—but he’s a real whopper—ta-ta.”

“Why ! who’s that you’ve got in there ?” says another, tearing by with his crest all shaggy with flying spindrift ; “one of them navy fellows ? Ah ! thinks he rules the waves, does he ?—well, there now ! we didn’t mean to make him so wet as all that—awfully sorry !—so-long ! mind the tide-rips, they play the very devil, even with us.”

“Ah ! ah ! nearly had you there, my boys !—should have done, too, if it hadn’t been for that fellow steering—been to sea before, eh ?—ah, yes, I daresay—well, you’re not a bad lot, as sailors go now-a-days—what ! English ?—well, how’s your navy ?—seems to us you don’t give us half the chance you did in the good old days.”

"Hallo there, my hearties!" calls another, "where'ye off to?—making for the tail end of the island?—well, it's true, we don't get much of a chance there this morning—but look here, tell you what! bet you three to one, we'll get you with the back-wash."

And so wave after wave goes by. Each one, as it comes roaring on, seems full of conversation and personality—some are tricky, some merely boisterous, some really spiteful, others dignified and majestic—rolling, rolling along, with quiet irresistible, forceful strength, disdainful of all fuss and splutter.

When we were on the yacht it looked a very little way to the island—now, from the level of the water, the distance looks twice what it did; and it is a long time before we seem to make much progress. All things have an end, however, even for an impatient ornithologist crossing an angry sea; and at last we are safely across the nasty looking belt of broken water, which we have been gradually nearing, where the tide is sluicing and rushing and boiling in a seething race. And then we find ourselves in comparatively smooth water, under the lee of the south-west corner of the island. The noise and turmoil of the white horses die away astern and we begin to take things rather more easily.

How different the rocks look from here, with their bold, frowning masses of granite, rising pile upon pile far above our heads, and seeming to defy us to attempt to land. How much more vegetation, too, there really is, than appeared from the yacht—dense tangles of cactus and agave with here and there clumps of low trees.

But now the most ticklish part of our task is before us, and we coast round the end of the island, looking for a likely spot to land on.

Just a year before (February 1st, 1907), all but a month, we landed here with the greatest ease, stepping quietly out of the boat on to the rocks; but to-day the swell is surging over the shelf which runs along the base of the almost precipitous cliffs, and falling back in cataracts

of creamy white foam. A little more of this, and it would be folly to attempt it ; still one does not like to get up early in the morning and row two miles across an adgry sea for nothing : so presently we fix upon our spot and decide to make the attempt. The swell is not quite so bad here, and there is a nice little shelf of rock all ready for us to jump on to, as the boat rises level with it.

"Pull her round, lads, and back her in stern first" says Gillam. "That's it ; easy now ; gently does it."

But there has been a momentary and deceptive lull in the surging waters, which had given us a feeling of false security ; and before we were aware of it we had nearly come to grief.

"Look out !—look out !—here she comes !—give *way* boys—give way like——." "Nearly on 'em then, sir, by G-d we were."

For the great surging wave comes rolling in, lifts us like a cork, passes under us at a giddy pace, and goes thundering, with a hollow whoof and resounding "Ker-plunk," smack against the rocks.

Down sinks the water again, carrying us willy-nilly with it—down, down, till we think to see the very foundations of the island, till indeed, the rocks below the water-line shew up pink and clean as any fresh run salmon, and of quite a different colour from that, where the chitons and limpets are clinging like grim death "betwixt wind and water."

As we pull away like mad, and wait for a better chance, the water comes pouring back over the shelf, in a small cataract of spume and milky froth.

"All right, boys !—that was only big Ben—he's not due again for a bit," cries Fuller.

So gingerly and warily we back her in once more. All four men are ready at a moment's notice to give way at the word ; and with the boat rising and falling, and swinging this way and that, we carefully watch for our chance. "Now for it—*steady* now—easy there—

be ready in the stern." "Look out! wait till she rises level—*now*!!"

But the man hesitates to spring and the chance is missed.

"No! No!—Too late! steady—steady."

Down the boat sinks again, till the shelf rises high above our heads, and we keep her off as before till the chance comes again.

"Here she is, then—a nice steady one,"—rising—rising—rising till we are level once more with the rock. "Back her in a bit—another touch—now's the time—jump man—*jump*—Hurrah!! bravo! well done, Bill!" And the first man's ashore.

And so we all in turn make our spring; timing the waves and our jump as we swing up and down. Then, while some clamber a little way up the rocks, others remain below or plant themselves in convenient positions; and the guns and bags and gear are at last all handed out, one by one, and passed from hand to hand to a place of safety.

But not before a bigger wave than usual comes surging up, slap over the ledge, and takes the bottom man well up to the arm pits. He clutches the rock and luckily hangs on; and in another moment is shinning up to us like a lamplighter, spitting the salt foam from his mouth amid roars of laughter. "Never mind, old man, you'll soon get dry here," is all the sympathy he gets from his mates, who are used to a wetting.

"Well, good-bye, boys, hope you'll get back to the ship all right, but don't forget to come and fetch us off," and with this parting farewell to the men in the boat, we go laughing and clambering up, among the massive boulders and great slabs of granite. For the first couple of hundred feet, it is all sheer climbing and shinning up the rocks. The gear has to be passed from hand to hand, till we reach some easier going, and then we leave the lunch under the shade of a bush, get our breath back, and begin to look around us.

CHAPTER III.

BIRDS.

THESE seven rocky islets belong *nominally* to the Venezuelan Government, but in reality to the sea-birds, the rightful lords, from ages immemorial, of their inhospitable and wild retreats.

Orquilla, the island we had landed on, has roughly the shape of a saddle-backed mountain, with a base of perhaps two or three miles and a height of nearly seven hundred feet ; Ludwig puts it at a much greater height.

All the time that we have been scrambling up among its huge boulders of granite (diorite *) the air has been filled with a multitude of birds—ten thousand flying forms, circling, hovering, skimming, crossing, dipping, swooping, rising and falling. Yet hardly a sound is to be heard. Only occasionally a harsh guttural note is uttered, as some bird, taken by surprise, sweeps off from its nest.

Birds had followed us from the time we got within a quarter of a mile of our landing place. Some of them, the gannets, had come swooping down, sailing over the boat with motionless wings, in a flight which is the very acme of graceful effortless motion. They came so close, that several times we could almost have touched them as they balanced themselves, just astern of the boat, against the stiff breeze. As they glided thus with wings outspread, they moved their heads from side to side, watching and

*Specimens kindly identified for me by Dr. Pryor of the Natural History Museum, South Kensington.



ORQUILLA—ROUGH GOING—PARTY FORCING A WAY THROUGH CACTUS
FOREST—NEAR THE SUMMIT.

[To face page 204.]

staring at us with their strange, rather mad-looking eyes. Doubtless they were wondering what manner of creatures we were, for we were almost certainly the first human beings they had ever examined at such close quarters.

Far above us, wheeling in never ceasing graceful curves, are hundreds upon hundreds of frigate-birds. High above the topmost trees, growing on the summit of the island, and above all the other birds, they are lying in wait for the gannets, whose pouches are full of succulent young fish. Their wings are spread like boards to the wind, and their long tail-feathers now and again open and shut like a giant pair of scissors.

Almost at once we come upon the nests of the gannets, scattered in endless profusion along the steep slopes of the island. There are three different species represented here, viz., the red-footed gannet (*Sula piscator*) the booby (*S. sula*) and the blue-faced gannet (*S. cyanops*). Perhaps the most common was the red-footed gannet, then came the booby, and a long way after both, the blue-faced gannet.

Each kind has its own peculiar and distinct quarters. The red-footed gannet was invariably in the low shrub-like trees of the black mangrove, where it makes an untidy nest of sticks, twigs, and grass roots. Totally out of proportion to the size of the bird, this nest looks as comfortless and small, in comparison to the dimensions of the bird, as a woodpigeon's. Sometimes we found as many as ten or twelve nests in one small tree. One egg is laid in each nest—white and chalky-looking, like that of a cormorant.

Many nests contained young in various stages of growth, from the naked just-hatched chick, through the beautiful white downy stages, to birds just beginning to acquire brown flight-feathers. This was in the month of January; and the red-footed gannet was then more advanced with its domestic arrangements than either of the two other kinds. The young of the intermediate stage are like round balls of exquisitely beautiful, fluffy white down—like a powder-

puff. They would send any member of the fair sex into ecstasies. How these young birds manage to keep themselves from falling from their clumsily made homes, when the old birds come lumbering on to the nests with a supply of newly-caught fish, is a mystery. Perhaps they are able to hang on with the sharp little claws which protrude from the ends of their webbed feet.

It takes several years for a gannet of this species to attain to fully adult plumage. At this period it appears in a dress of dazzling white, with black wing-tips, brick-red legs and feet, and a gorgeously coloured bill of opaline blue. Round each eye is a bare space, coloured yellowish-green, while the lower lids are tinged with cobalt-blue. What becomes of these old birds has always been another mystery for us, for in comparison with the "middle-aged" community they are extremely scarce. These "middle aged" birds are all brown, with white tails and rump. Immature birds or birds of the year are entirely brown or drab. They are the boys and girls of the race and have no domestic concerns.

The booby gannets (*S. sula*) we found for the most part in the lower parts of the island, building from almost sea-level up to a height of perhaps two or three hundred feet. They invariably nested upon the ground, among the rough vegetation of coarse grass and dwarf cactus, or on the bare rocks. The depression in the ground was lined with a few scanty twigs or bits of grass. Sometimes they contained two eggs, but the second had probably been officiously laid there by another bird, either too lazy or too bewildered to find its own nest.

The head, throat, upper-part of the breast and entire back of this gannet, are a beautiful chocolate-brown, the under-parts being white. The legs and feet are bright chrome-yellow, the bill is yellow at the base and shades off towards the tip into bluish grey. The iris, or so called pupil of the eye, is pale grey; while the eyelids are edged with bright blue.*

*Notes of all these colours were taken by the author on the spot.



THE BLUE-FACED GANNET (*S. cyanops*) ON NEST.

[To face page 207.]

Everyone has read of the tameness or stupidity of these birds, which are supposed to allow one to take any liberties one likes with them ; but our experience, on this island at any rate, was that they were far more likely to take alarm than either of the other two gannets. They seemed, in fact, as compared with the others, to be developing the first gleams of intelligence.

The blue faced gannet (*S. cyanops*) is in our experience, as far as the western Tropics are concerned, more at home on the low sandy cays of the Gulf of Mexico, where we have seen many thousands, but we found many nests of this bird on Orquilla. They were invariably on the ground, in quite exposed positions on the bare summits of rather isolated rocks, or among the loose rocky fragments which covered the steep slopes of similar positions.

Only the most vigorous and forcible treatment would induce them to leave their nests. Once or twice we sat down among them, taking care to keep just out of range of their sharp serrated bills, and leisurely took notes of the colours of these and of their feet. If they would have allowed it we could have patted their backs. The only notice they took of us was occasionally to stretch their heads in our direction and give a stupid sort of grunt. It seemed to us that this gannet was by far the most inane of the three, and one seemed to be sitting among a small party of hopeless imbeciles. This bird made not the faintest attempt to line its nest, if such it could be called, the egg being simply laid in a mere depression. Although usually there was not the least suspicion of a stick within yards of their nests, occasionally one of the birds, while brooding over its egg, would pick at an imaginary one, or go through the actions of trying to draw one towards it into the nest. If these futile actions indicated a vague recollection, in what we must perforce call the bird's brain, of some ancestral habit of building in low bushes or trees, it only seems to shew how little the performance of nest building is aided by any deliberate

and rational process of intention, as opposed to mere machine-like instinctive action.

The blue-faced gannet has a plumage of uniform white, with the exception of the wing-feathers and their coverts, which are dark-brown. The tail is also dark brown. The webs are dirty yellowish-drab, while the legs are greenish-drab. The bill is greenish-yellow, while the bare space between the two divisions of the lower mandible is Indian ink colour. The iris is yellow.

As far as we are aware, these islands are the only ones in the Caribbean or Mexican Seas, possibly in the whole world, where these three kinds of gannet could be observed breeding in such intimate association. On several occasions we have found two species, viz., the booby and the red-footed gannet, associated, but never before all three.

We hear and read now-a-days a good deal of the innate tendency of organisms to vary, and of the influence of fresh environment, natural selection, segregation and isolation in the production of new species; but in these three gannets, living in this isolated little world, it seems to us we have an excuse for pausing to consider the opposite side of the question, viz., the stability of species or the fixity of type one so often sees illustrated. For here, we have three perfectly distinct species of gannet, which have probably lived on these isolated islands for untold ages, and have been exposed through all this time to apparently exactly identical conditions, and yet have preserved intact, not only their distinctive specific peculiarities among themselves, but also have remained exactly identical with species of their own kind, found in far distant tropical seas. In this connection, we have compared gannets from this locality and the Caribbean Sea generally, with a series of like birds in the Natural History Museum, taken from far distant eastern seas; and have been unable to appreciate the least difference between the various kinds found in the particular localities under mention.

Now it is a certain fact that, if we could only go far enough back, we should find that these three gannets, so distinct to-day, had originally a common ancestor. In the course of the ages, however, by reason of the vicissitudes of change and climate which the earth suffered, we must presume that this common ancestral stock was exposed to differences of surroundings and conditions, which, aided by the influence of natural selection, eventually produced changes and modifications in the common type; so that in process of time the three species under consideration were evolved. These differences of environment have now apparently ceased to exist; and having ceased, how is it that each species still remains distinct, and continues to travel along the same lines down which it was originally set going? Why do they not tend to retrograde, to revert to the original type, or to fuse into one common species combining the good points of all three? We have everything present which is ordinarily supposed to be conducive to the formation of new forms, or the disappearance of existing ones—an inherently unstable plasm, isolation, segregation and natural selection; and lastly we might add that eliminative force known as the *survival of the fittest*. Yet under the same identical conditions, the red-footed gannet still continues to produce its own peculiar colouring and plumage and to build in trees, while the booby goes on producing its brown coat, and lays its eggs on the ground, and so on.

It is perfectly certain, that in times past it must have been a serviceable thing for the red-footed gannet to have these distinctive peculiarities, and likewise useful for the booby to have such a totally different plumage. Natural selection had seen carefully to that, and had picked and chosen among the countless variations, which had been produced by an unstable protoplasm, liable to vary in the presence of predisposing internal and external conditions.

But what is natural selection doing now? There is no question *now* (at least as far as we can appreciate) of

different conditions calling for different modifications. This stimulus, which had been sufficient before, in the presence of a plastic plasm, to conjure up new species, is non-existent. The conditions of life, as regards these birds (and the same applies to other species of gannets which we need not mention) throughout all the tropical seas, seem apparently to be remarkably similar.

To use a geological term, the species-producing forces seem to have arrived at a "dead level of erosion," and, just as in the cutting out of valleys by rivers, there comes a time when the forces represented by the eroding waters and the resistance offered by the rocks are nicely balanced; so in these three widely distributed gannets, we seem to have arrived at a point where the tendency of the plastic somatic plasm to vary, and the tendency of the germ plasm to go on producing on the same lines, are evenly matched.

Isolation, of itself alone, does not seem capable of producing fresh varieties any more than segregation. Natural selection is only the final arbiter in determining what variations shall survive, *after* they have been produced by the influence of external conditions. If the external conditions are the same all the world over, natural selection cannot come into action.

How long, then, are these three species going to continue the even tenour of their way? How long is Nature going to have, as regards these particular birds, three strings to her bow? In other words, when is the eliminative process of the survival of the fittest going to make itself evident?

At the present time, so thoroughly has natural selection done her work in the past, in the case of each separate species under mention, producing in each case such a fixity of type and such a perfect adaptation to conditions, different as these adaptations are, that a state of stable equilibrium *seems* to have been brought about. It may be, however, that we are in too great a hurry, and that,



LOS HERMANOS ISLETS—FRIGATE-BIRD ON NEST—COMPARE
SITUATION WITH SITE SELECTED IN SWAN ISLAND.

[*To face page 211.*

after all, this state of equilibrium is only apparent. Perhaps the mere fact that the red-footed gannet (*S. piscator*) has taken to building in trees is an indication of this, and that this fact will determine which species is to be the ultimate victor in the struggle. At any rate, from our own observations in the Caribbean, this bird certainly seems to be more numerous than either of the other two species, and especially so in the case of *S. cyanops*.

When we had climbed between three and four hundred feet up the steep arrête-like edge, which extends from the south-western corner of the island from the sea-level to the summit, we came to a sudden break in the ascent, and found ourselves on a small more or less level plateau. Here a most interesting and remarkable sight was suddenly displayed, in the shape of scores of frigate-birds (*Fregata aquila*) which were busily engaged in nesting operations. The plateau was strewn with large boulders, between which grew tall tussocks of coarse grass, low sprawling bushes, or an occasional patch of cactus. On every tussock of grass, and sometimes on the low bushes, a nest had been built, and on the nest sat a frigate-bird, either hen or cock. The nests were in every case only just raised above the ground, and composed of sticks and twigs with a more or less comfortable lining of dried grass. From this little plateau, upwards to the summit of the island, and on either side of the ridge which leads to it, multitudes of these birds had their nests.

It was a sight we had never seen before, and amply repaid us for our hot climb in the grilling heat, which poured down upon the rocks from a blazing tropical sun and was reflected on to our faces. It was a sight, too, which only the very smallest percentage of visitors to the West Indies and neighbouring seas, even those with natural history aspirations, could have had the pleasure of seeing; for these birds only choose the most secluded and lonely retreats, such as these, whereon to raise their young.

We were much struck with the quiet and confiding behaviour of the birds ; and it was only towards the very end of our photographic stalks, when the camera had clicked within six feet of the nests, that they became uneasy and clumsily flew from their nests. In respect of this awkward behaviour on shore, nothing could be in greater contrast as compared with their inimitable powers of flight, once launched into their native element.

To this awkwardness, and the strange results it sometimes leads to, we have referred in the account of Swan Island. At present we were more concerned in admiring, at such close quarters, the beautiful greenish-purple, sheeny reflections of their plumage, and the magnificent spread, fully six feet, of their powerful wings. In a dead specimen, it was once as much as we could do to touch either tip with outspread arms. It must be a sensation, rarely experienced by bird-lovers, to have a colony of such great birds swooping and beating the air just above one's head ; and the memory of this is one which we shall always look back upon and treasure as one of the most delightful of our experiences. It might be imagined that with such formidable bills as these birds possess, and with such powerful wings, frigate-birds might be capable of giving the disturber of their lonely haunts an uncomfortable time of it ; but whether they could do so or not if so disposed, they are in fact the most mildly behaved of birds.

As we have indicated above, both the cock and hen assist in the process of incubating their eggs. Each nest we examined contained, either a single large white egg or a freshly hatched naked squab. The very old cock birds, easily distinguished by the curious vivid red translucent sac, which hangs pendulous from the throat—did not seem to concern themselves greatly with these domestic cares. This may have seemed more apparent than was really the case, for these old cocks were very scarce in comparison with younger males, which did not appear to be provided with distensible sacs. Of the thousands of



FRIGATE-BIRD ON NEST (OLD COCK)—LOS HERMANOS ISLANDS.

[To face page 212.]

birds present, of all ages and sexes, we should say there were not ten per cent. which displayed this singular pouch. The few red cocks which I observed incubating, were very shy, and I only once succeeded in taking a snap-shot of one.

At this height, where we first came across any nests, the Trades were blowing fresh and strong, and to see these old birds, poised and balanced, against the stiff breeze, thirty feet or so above our heads, was a sight we shall not soon forget. The translucent sac, vivid scarlet or blood red in colour, is about the size of a large double fist, but more elongated in shape. Its neck is rather long and constricted, which causes it to wobble about in the wind in a strange and somewhat ridiculous way. It reminded one, for all the world, of a child's gaily coloured toy balloon. What purpose it serves it is rather difficult to say. It is capable of being inflated or deflated at the pleasure of the bird; but it can hardly be intended as an adornment to fascinate the hen, because by far the larger proportion of young males already mated were without it. Nor would it seem necessary as an increased aid to buoyancy, for between the entire skin of the bird and the deeper tissues is a mass of air cells, mere spaces in the loose connective tissue, which can be filled with air at the pleasure of the bird. Besides which, why should it be necessary for the cock bird to be more buoyant than the hen?

Old hens are to be distinguished by having the entire head and neck, as well as the under-parts of the body, white. Younger hens, which were breeding, can hardly be distinguished from their young mates. Both have black heads with white throats and breasts.

Briefly tabulated, we noticed the following varieties and stages of plumage: (1) *Old males*, with red gular sacs—rest of plumage black, with a beautiful glossy, greenish-purple sheen. Infinitely the rarest.

(2) *Old females*. Head, nape, throat and under-parts white. Rest of plumage black, with the same gloss as

the old male, but somewhat duller. On the pectoral region a broad dusky band extends across the breast on each side, but does not meet in the middle line. Distinctly scarce as compared with the next to be described.

(3) *Young males and females.* Head, nape and upper-parts black, rest of plumage as in No. 2. Bill, pale-bluish-grey, light lavender-blue at base; iris sepia-brown; legs and webs pale flesh-coloured; gular sac (not distensible) pale lavender-blue. These birds made up the great bulk of the colony.

(4) Some few birds, apparently older males than those of No. 3, had *orange* gular sacs, and in some the white under-parts were mottled and becoming darker, as if preparatory to turning uniform black as in the quite old males.

Almost directly after leaving this little plateau, we crossed a narrow razor-edge, from which the ground fell precipitously on either side to the sea, a matter of three or four hundred feet. Here one of our party, completely exhausted by the heat and the lack of breakfast, which he had been unable to get before leaving the ship, had to cry enough, and we left him under the shade of a bush. On the other side of this edge was a steep talus slope, strewn with angular fragments of rock, splintered and cast down from above, by the alternate expansion and contraction which occurs during the intense heat of the day and the subsequent cooling during the night. The rock of which Orquilla is composed is a species of granite called diorite, and it was interesting to notice the different effects of weathering here as compared with the kind met with on Blanquilla (biotite).

In crossing this slope, we were startled to hear shrill raucous cries proceeding from the holes and crevices immediately beneath our feet, and in another minute we became aware that we had stumbled upon a nesting colony of boatswain-birds (*Phaëton æthereus*). Had it not been for their cries, caused by the noise of our feet stumbling



NEWLY HATCHED NAKED SQUAB OF FRIGATE-BIRD.



OLD FEMALE FRIGATE-BIRD ON NEST.

[To face page 214.]

amongst the rocks, we might easily have passed them by undiscovered ; for no birds had been noticed flying about in the neighbourhood, and only one or two had been seen further out at sea, as we approached the island. As it was, the nests of several were soon tracked down ; and after a lot of trouble, for these birds have formidable bills and are very fierce, several of them were hauled out of their deep underground retreats. During the process, which seemed to give the more pleasure to the sailors in proportion to the difficulty of the undertaking, the birds uttered the most shrill and angry cries, a very unpleasant and discord-making note.

Of all sea-birds, however unpleasant its cry may be, the boatswain-bird is, to us, incomparably the most lovely ; whether you see it at such close quarters as these or flying far away from land on the wide ocean. In company with the large family of petrels, which includes such birds as albatrosses, shearwaters and Mother Carey's chickens, it is a true ocean-going bird, and is met with hundreds of miles from shore. The farthest distance from land at which I have myself seen boatswain-birds (or rather at which I have actually noted down the fact), was in latitude $26^{\circ} 25'$ north ; longitude $37^{\circ} 44'$ west ; that is to say, these birds, which belonged to another species (*Ph. americanus*) than the ones on Orquilla, were 1,400 miles from their home in Bermuda.* This boatswain-bird arrives in Bermuda every year about the end of February and leaves about the end of September. We have seen it breeding there in May, and it is practically certain that it spends all the remaining part of the year, wandering over the tropical part of the Atlantic far away from shore. How long our birds on Orquilla remain on shore we cannot say.

Comparatively few people can have had the opportunity of handling a live boatswain-bird ; and therefore the generality who see them at large, can have no proper idea of their dazzling beauty ; for a stuffed specimen gives one

*This was on December 10th, 1903. Another bird I noted was in lat. $21^{\circ} 51'$ N., long. $43^{\circ} 35'$ W.

about as much idea as a badly mounted tiger gives of the lithe graceful form of the real animal in its jungle home. The breast of a living specimen of *Phaëton æthereus* is a vision of transcendental, virginal whiteness, and of purity itself. The feathers, from the chin backwards to well down past the breast, are arranged somewhat after the fashion of a grebe's; but they are white as driven snow, silky and glistening in the tropical sun with a hundred reflections of brightly burnished silver. It is the sun-god of these bright tropical seas; the Helios sung by Homer.

One night, as we were coasting along the northern shore of Trinidad, one flew on board and was partially stunned. It was carefully brought down to the saloon, where we were at dinner. In the strong electric light, which shed its rays downwards over the table, it seemed like some ethereal conception of a God of Purity. Not the least of its charms were the beautiful deep coral-red of its bill and the shining coal-black eye, large and somewhat prominent. Never was bird more happily named—*Phaëton æthereus*; seldom is it that a scientific name has been so accurately descriptive and yet so poetical; for one must have seen this bird out on the broad Atlantic, miles from any land, glittering like a white butterfly, high up against the deep cerulean blue of the sky, to realize its god-like nature.

When we had sufficiently examined our unwilling guest, our lady of the yacht kissed it on the top of its snowy head; and with this protective imprint, it was returned, a happy creature, to its native element. Hard would it have gone with anyone then, who had wrought it any harm.

Oftentimes, these birds have been attracted to our mast-head lights. At night time, far out at sea, they glitter for a second in the strong glare of the electric beam, and then are swallowed up in the dark immensity of the ocean; while their wild haunting cries seem to speak to us of the infinite wastes of water all around.

Nearly all the nests we examined on Orquilla, on this ninth day of January, contained a single egg, somewhat similar in shape and colouring to a kestrel's. One or two nests were occupied by downy chicks. As we examined them, the thought occurred to us, how strange it was, that their beautiful parents should choose such deep and dark holes in the rocks, wherein to bring them up. How strange, too, that these ocean-roaming birds, which hear the call of the land but once a year, should wing their way back to them, at this time, with such unerring instinct, over the trackless sea. For these free creatures of the air and the blue water, these islets represent the one small bond which still links them with the land; and back they yearly come to nestle once again in the warm bosom of their foster-mother.

We have remarked before, that when one first sets foot upon little islets such as these, which have never before been robbed of their ornithological secrets, there is generally to be found some welcome little surprise to greet the happy wanderer, anxious to justify the trouble that has been taken in getting him there.

Such was the case on Orquilla, and it was upon the little plateau where we first came upon the nests of the frigate-birds, and while I was taking photographs, that my eye fell upon an unfamiliar looking land-bird. In a second I had recognised it, as I thought, for some sort of thrush which I had never seen before—perhaps some totally new species, or even genus, which had gone on surviving here through the ages, and which was, may be, a relic of some bygone mountain race, from the days when these islands were some thousands of feet nearer the skies than they are to-day.

To drop the camera and beckon frantically to the sailor who was carrying my gun some way off, was, as they say, “the work of a moment.” The bird was sitting on a low bush, forty yards away. If the man came to me, he would for a certainty frighten it away. I signed to him to shoot it—but could he do so? I watched him in an

awful suspense, as he took a long coldly deliberate aim, of what seemed to me many long seconds' duration. Would he never fire? Perhaps this bird was the sole survivor of its race—perhaps it would fly away before this dark deed could be done, and we should never see it again,—and what if he missed it after all! In the long agony of suspense, I was on the point of crying, “All right, don't try any longer, but come quietly here,” when suddenly, *bang* went the gun—the bird had dropped, and the man was rushing forward like a badly trained retriever. “Good man! he has done it”—he is, in fact, a naval reserve man, and I blessed with heartfelt thankfulness the forethought of some former Lord of the Admiralty, who had thus provided a naturalist with a sailor who could shoot straight, if somewhat deliberately.

The bird, after all, as a matter of fact, proved to be a pearly-eyed thrasher (*Margarops fuscatus*); but it was distinctly interesting to find that it had established itself on this lonely rock, for its proper home is further north, in the Greater Antillean Islands (with the exception of Cuba) and in the more northerly of the Lesser Antilles. It has been also previously recorded by Dr. Hartert, of the Tring Museum, from the island of Bonaire, near Curaçao, and no doubt has found its way to that island as well as this, by having been carried by the Trade-winds. It is about the size, and has at a distance somewhat the appearance, of a mistle-thrush, but belongs to the mocking bird family and not to the true thrushes. Higher up, along the saddle-backed ridge which stretches along the top of the island, we saw several more examples, and shot two for the purpose of future comparison.

As far as we are aware, there are no springs on Orquilla; so that one must believe that these birds subsist on the scanty rainwater which collects at odd times upon the rocks, or in the angles made by the leaves, or stems of vegetation, or even on the juices derived from the cactus. But, however they live, here they were, and from all appearances they seem to have quite established themselves.

Not the least interesting of the few land-birds which we found on Orquilla, were the pallid little ground-doves (*Chamæpelis perpallida*) which Dr. Hartert first described as occurring on the Island of Curaçao. They ran in front of us, a few yards only from our feet, not deigning to fly, and hardly to hurry, in their unsuspecting innocence; supremely unconscious, as they were, of the sordid cruelty of the strange two-legged creatures, who had come so suddenly among them, and the likes of whom they had never set eyes upon before. Like so many other birds, which live a peaceful and absolutely undisturbed existence, as far as man himself is concerned, these little ground-doves showed a most noticeable disinclination to use their wings, and seemed almost as tame as birds which have been found inhabiting oceanic islands. To our shame, be it said, that before we left the island, we had hardened our hearts and shot two of them, a cock and a hen. They were so tame that we had to drive them sufficiently far away to perform what seemed a cold-blooded act, and we felt like the "wicked villains" in the "Babes in the Wood." Our justification was, that it was necessary to have ocular and scientific proof of the range of this new species.

Another land-bird, which charmed us with its sweet fluty notes, was the island grackle (*Holoquiscalus insularis*). This grackle had only previously been described from the island of Margarita. It is quite unknown on the island of Blanquilla, only ten miles distant. A year before, when we landed on this island, we found it feeding on the agaves which were in full bloom. Doubtless it found many insects in their honey-laden corollas. It was rather curious that this time, although only a month earlier than on our first visit, there was not a sign of an agave likely to flower on the island. All around were the old dead scapes of last year's flowers, but not a single budding stem. Either, therefore, there is no continuous yearly succession of flowering plants, or the season of flowering is an uncertain quantity.

The grackles appear to have been attracted to these

isolated islands by the crumbs which fall from the sea-birds' table ; for they seem to live to a large extent on unconsidered trifles which these latter birds drop or leave about their nests. Sometimes their levies take a more aggressive turn than this, for I saw a hen grackle trying to break the egg of a gannet, which had just left its nest. She persistently hammered with her bill on the egg, and on my twice driving her away, quickly returned and commenced operations again—another instance of how tame the birds on these islands are. The song of this island crackle is particularly sweet, and their notes were the only *cheerful* sign of life existing in the solemn silence which seems to reign on these islands.

Two other land-birds which we found dwelling here were the small black finch (*Euethia johnstonei*) which we had discovered on Blanquilla, and a peregrine falcon (*Falco anatum*) ; the latter, doubtless, reaping a rich harvest from any unprotected young gannets or frigate-birds. To see it swinging round the rocks, on the look-out for a meal, a hundred feet or more below us was a fine sight.

The last part of our climb, before we reached the summit of the island, was both hot and stiff work ; for the steep slopes are covered with loose boulders hidden among coarse grass, knee-deep. Decaying tree-trunks and an almost impenetrable forest of upright cactus, added considerably to our difficulties. To get through them at all, we had to cut a path with our machêtes. The heat was staggering, and the loose boulders especially treacherous ; for a fall among the deadly columns of cactus was an event too ghastly to contemplate. There is an end, however, to most things ; and so, panting and sweating, wriggling and squirming, beneath the spreading branches of "black mangrove" trees, we reached the top and stood upon a large heap of rocks.

Stretching away along the saddle-backed ridge of the island, was a perfect sea of more cactus and tall grass, while scattered here and there were clumps of "mangrove"



THE TOP OF ORQUILLA—CUTTING A WAY THROUGH THE CACTUS.

[To face page 220]

trees crowded with more gannets. Frigate-birds and boatswain-birds were flying in every direction, and more nests of both were found. Every rock and bush seemed to harbour an iguana,* of which there must be many thousands on this island alone.

Seven hundred feet beneath us lay the Caribbean. The wind had dropped, and from this height the sea looked calm and peaceful as a lake. It stretched away on all sides to the far distant horizon, streaked and veined in the neighbourhood of the islands with many dark lines denoting currents. Away to the west lay Blanquilla, appearing little more than a long sandy spit in a setting of blue. All around us rose the rest of the islands, each with a fringe of white breakers on the windward side. Like Moses on the top of Pisgah, we looked across at them with longing eyes, knowing full well, that in all human probability we should never have the chance to explore them. Yet any one of them might contain something which would well repay the enthusiastic naturalist for an arduous climb among their sun-baked declivities.

There was a more alluring thought still, and one which had the elements of possibility in it ; for might not any or all of these islands represent the last stronghold of those elusive races of petrels (*Æstrelata*) which used to nest in burrows in the ground, high up in the lonely mountains of Guadaloupe, Dominica and Jamaica ? This very island we were on, with its many holes scattered among the talus slopes of splintered rock, so secure too from the marauding attacks of the mongoose, and eke, the more familiar rat, both of which have played such a fell part in the extermination of these interesting petrels (*Æstrelata hæsitata*) and (*Æ. jamaicensis*), might well harbour, at the proper breeding season, the last remnants of either of these two races, or even give shelter to a race peculiar to itself. To make sure, one would have to come here at the proper breeding season, with more leisure

* *Iguana tuberculata*,

to hunt about for likely spots than we had ; for petrels, owing to their nocturnal habits, may be nesting beneath the very rocks upon which one is actually treading, and yet show not the faintest indication of their presence.

This we well remember having had very patently brought to our notice in the case of another petrel (*Puffinus obscurus*), which we found in May, 1907, nesting in some honeycombed rocks of coral limestone, on a small islet in the Bermudas. Here, secure from rats and the interference of man, a small colony still held out, descendants, most probably, of that mystic bird which the early colonist called "Cahow," and which in their straits for food they practically exterminated. On this occasion, had it not been for the guidance of Mr. Mowbray, a Bermudan naturalist, I should probably have left the rock under the impression that there was not a bird on it ; for there were none to be seen flying about, and their nests were most difficult to find, even when, as Mr. Mowbray did, one knew of their locality to within a few yards. I took one of these birds for identification, and it is now in my collection. Lieutenant Reid, R.E., in "The Birds of the Bermudas" (The Zoologist, Oct., 1877), relates that he found two nests of this bird in 1874. Since then there has been no record or knowledge of their existence on the Bermudas, until Mr. Mowbray found them in 1907 on this small islet. It is interesting to note the following remark which Mr. Reid makes in his account of this bird : "I know of only one instance of a 'Cahow' being seen on the wing, in the daytime, in Bermudan water."

The real difficulty of finding petrels on the Hermanos Islands, would be to know just when they breed ; for petrels vary locally in the time of their nesting in the most unaccountable manner ; and as, for the most part, they only visit the land at this time, unless one can hit off their breeding season, there is little chance of finding them "at home." In this connection, I might state, that whereas in the Bermudas, I found Audubon's petrel nesting and

with eggs on May 12th, Colonel Feilden obtained eggs of this bird in Barbados in March.

In April, 1906, while at sea half way between the Hermanos group and the island of Haiti, we fell in with one or two large flocks of a "medium-sized shearwater" which I was unable to identify with certainty. Possibly they were only Audubon's, although they seemed somewhat large for this species, and certainly too small for another found in the West Indies, to wit *Puffinus gravis*. But whether they were or not, and whether or not they were making for our islets, we still like to fancy that somewhere or other among "the Seven Brothers" there still exists a rare race of "*Diablotins*," that ghost-like race of devil-birds of which the West Indian negro, with his superstitious notions, had such strange tales and half true ideas.

To show how easy it would be for the remnants of such a race to wander upon the sea unidentified, and where their existence for years might be unsuspected, if only their home had been undiscovered, to say nothing of the difficulty there always is of procuring examples of strange birds at sea even when recognised, we may relate that on one occasion, while crossing the Atlantic with Sir Frederic Johnstone in his yacht "*Zenaïda*," a petrel flew on board on the last day of 1905, and was so damaged that it was easily caught. I made a "skin" of this bird, and it proved to be an example of a very rare petrel, *Estrelata arminjoniana*—which has its only home in the island of South Trinidad, thousands of miles away in the South Atlantic.* When it came on board we were in lat. 21° 51' N., long. 43° 35' W., seven days out from Madeira, and roughly twelve hundred miles north of the equator. By an almost miraculous chance it happened to fall foul of our rigging, but had it not done so and paid the penalty, what man, were he never so wise in the discrimination of strange birds, would ever have suspected the presence of such a stranger?

* For an interesting account of this bird in its island home see that of Mr. M. J. Nicoll in "Three Voyages of a Naturalist."

But we might have quoted an even better instance of the elusive ways of these interesting birds in the case of the one we mentioned above, viz., the great shearwater or *Puffinus gravis*. This bird occasionally visits our own shores; and any one who has crossed the Atlantic, in temperate or tropical regions, cannot fail to have noticed this superb flyer, as it swoops and skims over the foam-crested waves with the very acme of perfected flight. Yet it is hardly two years since the eggs of this well-known petrel were taken for the first time, viz., by Mr. Keytee in the Island of Tristan d'Acunha.

When we are building our castles in Spain, we like to dream sometimes of finding it somewhere among the precipitous rocks of "The Seven Brothers."

THE END.

INDEX.

ACACIA (*Pithecolobium dulce*), 181.
Acanthocybium solandri, 70.
Actinozoa, 61.
æthereus, *Phaëton* (Boatswain-birds)
 214, 215, 216.
 Agassiz, 129, 136.
alcyon, *Ceryle* (Belted Kingfisher),
 160, 183.
 Alley and Page, 19.
Alpheus, 65.
 Amber "fish" (*Seriola lalandi*), 73.
 —jack (*S. dumerili*), 73.
 American Fruit Co., 21.
americana, *Parus* (Parula Warbler),
 53.
americanus, *Phaëton* (Boatswain-
 bird), 214, 215, 216.
Ammodiscus, 87.
anatum, *Falco* (Peregrine-Falcon)
 220.
 — *Pandion* (Peregrine-Falcon),
 52.
 Andrews, Dr., 87.
androgynus, *Ruscus*, 93.
ani, *Crotophaga* (Black Cuckoo), 40.
 Animal, Vegetable and Geological
 Features of Blanquilla Island,
 177—186.
annulata, *Ophichthys colubrinus* var.
 33.
antillarum, *Buteo* (Red-tailed Buz-
 zard), 52.
aquila, *Fregata* (Larger Frigate-
 bird), 40, 211.
 Archæan limestone, 185.
arminjoniana, *Cestrelata*, 223.
Balistes (Trigger-fish), 67.
 Barbados, Oceanic deposits of, 86.
 — Swan Island compared with,
 89.
Barracuda (*Sphyræna*), 59.
 — (*S. barracuda*), 72.
 Bartlett's Deep, 4, 129, 138.
 Bat-ray, 81.
 "Bete Rouge," 116.
Biotite, 155.
 Birds of Blanquilla Island, 157—169

Birds of Hermanos Islands, 204—224
 — Swan Island, 38—54.
Birgus (Robber-Crab), 118.
 Bitterns, 40, 44, 151, 160.
 Blanquilla Island, 145—186.
 — Birds of, 157—169.
 — History of, 146.
 — Inhabitants of, 152.
 — Plan of, 182.
 — Some Features of,— Animal,
 Vegetable and Geological, 177—
 186.
 — Zenaida Bay, 150.
 Blennies (*Clinus nuchipennis*), 66.
 — (*Enneanectes carminalis*), 66.
 Boatswain-birds (*Phaëton æthereus*),
 214, 215, 216.
 — (*P. americanus*), 215.
bonducella, *Cæsalpinia*, 101.
 Booby, 40, 115, 185, 205.
 Borradaile, Mr., 119.
 Botanical, Animal and Geological
 Features of Blanquilla Island,
 177—186.
 Botany of Swan Island, 90—104.
brachydactyla, *Geothlypis trichas*, 53.
Brachyura, 119, 124.
brevipennis, *Myiarchus* (Curaçao
 crested Flycatcher), 160.
Brosimum (Snake-wood), 90.
 Brown, Mr. Jukes, 86.
 Buccaneers on Swan Island, 24—30
Bursera (Mastics), 91.

CACTUS, 180, 182.
 — (*Cereus*), 182.
 — (*Echinocactus*), 183.
 — (*Melocactus*), 183.
 — (*Opuntias*), 183.
Cereba, 38, 92, 162.
cærulescens, *Dendroica* (Black-
 throated Blue Warbler), 53.
Cæsalpinia bonducella, 101.
Cancellus parfaiti, 124.
capræ, *Ipomœa pes*, 101.
Capromys (Rats), 103.
Cardinalis, 162.

- Carex*, 185.
caretta, *Thallassochelys* (Loggerhead Turtle), 32.
carinalis, *Enneanectes*, 66.
carolina, *Porzana* (Sora Rail), 52.
carolinensis, *Galeoscoptes* (Cat-bird or Carolina Thrush), 40.
 — *Pandion haliaetus* (Osprey), 52.
 Cat-bird (*Galeoscoptes carolinensis*), 40.
 Cayman, Grand, 16, 19.
 — Little, 16.
 Cedar, Bay, 101.
 — tree (*Cedrela odorata*), 93.
Ceratophora (Devil-fish), 81.
Chamæpelis (Ground-Doves), 38.
 — (West Indian Ground-Dove), 38, 102.
 Chapman, Mr. F. M. 112.
Chenopodium, 101.
cheriwayi, *Polyborus* (Caracara), 160.
 "Chicken hawk," 52.
 Chiff-chaff (*Phylloscopus rufus fortunatus*), 48.
Chlænopagurus andersoni, 123.
 Clarke, Mr., 162.
Clibinarius, 65, 124.
Clinus nuchipennis, 66.
Coccoloba (Sea-grape), 95, 101.
Cocoanuts, 16—18, 95.
Cæreba (Honey-creepers), 38, 92, 162.
columbarius, *Falco* (American Merlin Hawk), 52.
Conocarpus (Mangrove), 106.
Conurus, 162.
Copernicia (Thatch Palm), 91.
 Corals and Coral Reefs, 55—68.
 — (*Meandrinæ*), 64.
coronata, *Dendroica* (Myrtle Warbler), 40.
 Coypu, 113.
 Crabs (*Cenobita diogenes*), 118—127.
 — (*Clibinarius*), 65.
 — (*Remipes scutillatus*), 65.
 — Land, 38, 92.
Cristellaria, 87.
 Cuckoo (*Crotophaga ani*), 40, 42.
cyanops, *Sula* (Blue-faced Gannet), 205, 207, 211.
 DALMAS, Count, 147.
 Dampier, 27, 146, 178.
Dendroplex, 162.
 Devil-fish, 76—82.
Diablotins (Devil-birds), 223.
Dicerobatis (Devil-fish), 81.
diogenes, *Cenobita* (Hermit-Crab), 118—127.
discolor, *Dendroica* (Prairie Warbler), 47.
discors, *Querquedula* (Blue-winged Teal), 47.
dominica, *Dendroica* (Yellow-throat Warbler), 47, 53.
dominicensis, *Tyrannus* (Grey King bird), 158, 160.
 Donkeys on Blanquilla Island, 177.
 Doves, (*Chamæpelis*), 102.
 — (*Columbigallina perpallida*), 158, 159, 219.
 — (*Zenaida* sp ?), 159.
 Duck (*Erismatura jamaicensis*), 47.
dulce, *Pithecolobium* (Acacia), 181.
dumerili, *Seriola* (Amber jack), 73.
 Dyewood (*Maclura tinctoria*), 90.
 EEL (*Ophichthys colubrinus* var *annulata*), 33.
elongatus, *Drymæus* (Land-snails), 168.
Enneanectes carinalis, 66.
Epinephelus moris, 73.
eremita, *Mimocichla rubripes* (Swan Island Thrush), 40.
ferryi, *Cæreba*, 164.
Ficus (Figs), 94.
 Finches (*Euthia johnstonei*), 159, 160, 220.
 — (*E. sharpei*), 161.
 Fishing: at Swan Island, 69—82.
flabellum, *Rhipidigorgia* (Sea-Fans), 64.
 Flagstones, 83.
flavipes, *Totanus* (Yellow-shank), 51.
 Flycatchers (*Myiarchus brevipennis*), 160.
 — (*Setophaga ruticilla*), 47, 48, 54.
 — (*Tyrannus dominicensis*), 158, 160.
 Fol and Sarasin, 137.
 Foraminifera, 86, 87.
fortunatus, *Phylloscopus rufus* (Canary Islands Chiff-chaff), 48.
 Frigate-birds (*Fregata aquila*), 40, 211.
 — on Little Swan Island, 109—112.

"Fullers Earth," 85-88.
fuscatus, *Margarops* (Pearly-eyed Thrasher), 218.
Fustic (*Maclura tinctoria*), 90.

GANNET (*Sula cyanops*), 205, 207, 211.

— (*S. leucogaster*), 185.
 — (*S. piscator*), 40, 115, 205, 211.
 — (*S. sula*), 40, 115, 189, 205, 206.

Geological, Animal and Vegetable Features of Blanquilla Island, 177-186.

gilvus, *rostratus*, *Mimus* (Curagao Mocking-bird), 160.

Globigerina, 87.

Goats on Blanquilla Island, 177.

Grackles (*Holoquiscalus insularis*), 219.

Grass-ticks, 116.

gravis, *Puffinus*, 223, 224.

Gregory, Dr., 88.

Grouper, 73.

Guaiacum Tree (*Guaiacum officinalis*), 180.

Guanos, 178.

Guilandina (Nicker-nut Bean), 95.

gumnifera, *Bursera* ("West Indian Birch" or Indian Skin), 95, 96.

Guppy, Mr., 99.

Hæmatoxylon (Logwood bush), 93.

hæstata, *Estrelata*, 221.

haliætus carolinensis, *Pandion* (Osprey), 52.

Hawks (*Buteo* sp. ?), 160.

— (*B. antillarum*), 52.

— (*Cerchneis* sp. ?), 160.

— (*Falco anatum*), 220.

— (*F. columbarius*), 52.

— (*Pandion anatum*), 52.

— (*P. haliætus carolinensis*), 52.

— (*Polyborus cheriwayi*), 160.

herodias, *Ardea* (Great Blue Heron), 159, 183.

Hermanos Islands, 189-224.

— Birds of, 204-224.

Hermit-Crabs on Little Swan Island, 118-127.

Heron (Ardea herodias), 159, 183.

— (*Budorides robinsoni*), 151, 160

— (*B. virescens*), 40.

— (*Nycticorax violaceus*), 151, 159

Hippomanes (Manchineel), 95.

Hirst, Mr. George, 99.

History of Swan Island, 18-20.

Honduran Sea Bottom, 130.

Honey-creepers (*Cæreba*), 38, 92, 162.

— (*C. ferryi*), 164.

— (*C. lauræ*), 164.

— (*C. lowii*), 164.

— (*C. luteola*), 164.

— (*C. uropygialis*), 164.

Howe, Mr. Allen, 85.

Humboldt, 146.

Humming-birds, 38, 92.

— (*Chrysolampis moschitus*), 158, 160, 161.

Icterus, 162.

Iguanas, 115, 178, 179, 221.

— (*Iguana tuberculata*), 221.

imbricata, *Eretmochelys* (Hawksbill Turtle), 32.

Indian Bat-Ray (*Pteroplatæa micrura*), Embryo of, 80, 81.

— Skin (*Bursera gumnifera*), 95, 96.

insularis, *Holoquiscalus* (Island Grackle), 219.

Ipomœa, 95, 101.

— *pes capræ*, 101.

Island Floras, 97-104.

jamaicensis, *Erismatura* (Spine-tailed Duck), 47.

— *Estrelata*, 221.

Jelly-fish (*Linerges mercurius*), 35.

johnstonei, *Euethia* (Johnstone's grassquit), 159, 160, 220.

Kerner, 46.

Kingfisher (*Ceryle alcyon*), 160, 183.

Lagena, 87.

Laguncularia (Mangrove), 106.

lalandi, *Seriola* (Amber "fish"), 73.

Land Crab, 92.

lauræ *Cæreba*, 164.

Lavayasse, Dauxion, 146.

Leguminosæ, 103.

Leopard - Shark, Contents of stomach of a, 34.

leucocephala, *Columba* (Bald pate Pigeon), 40.

leucogaster, *Sula* (Boobies), 185.

Life in the deep Sea, Conditions of, 134-137.

- Lithothamnion*, 107.
 Little Swan Island, 105, 127.
 — Frigate Birds on, 108–112.
 — Hermit-Crabs on, 118–127.
Livona pica (Magpie Trochus), 119
 Logwood bushes (*Hæmatoxylon*), 93.
lowii, *Cæreba*, 164.
 Ludwig, Richard, 147.
luteola, *Cæreba*, 164.
Lutiana (Snappers), 73.

macularia, *Actitis* (Spotted Sand-
 pipers), 51.
 Madrepores, 60.
 Mahogany, 93.
 Manchineel (*Hippomanes*), 95.
 Mangroves, 95.
 — (*Conocarpus*), 106.
 — (*Laguncularis*), 106.
 Mansveldt, 26.
marina, *Zostera* (Turtle Grass), 35.
 Marine Life of Swan Island, 55–68.
 Markham, Sir Clements, 145.
 Mastics (*Bursera*), 91.
Meandrinæ (Brain-corals), 64.
melancholicus, *Tyrannus* (Melan-
 choly Tyrant-bird), 165.
Melanerpes, 162.
melanurus, *Capromys*, 113.
mercurius, *Linerges* (Thimble Jelly-
 fish), 35.
micrura, *Pteroplatea*, Embryo of,
 80, 81.
midas, *Chelone* (Green Turtle), 32.
Mniotiltidæ (Wood-Warblers), 44,
 52.
 Mocking-birds (*Mimus gilvus rostra-
 tus*), 160.
 — (*M. polyglottus*), 169.
morio, *Epinephelus*, 73.
moschitus, *Chrysolampis*, (Ruby and
 topaz Humming-bird), 158, 160,
 161.
 “Möwe,” 189.
 Mukler, Mr., 87.
mydas, *Chelone* (Green Turtle), 178.
Myopotamus, 113.
 Mysteriosa Bank, 129.

 NICKER-NUT BEAN (*Guilandina*),
 95.
Nodosaria, 87.
noveboracensis, *Seiurus* (Water-
 Thrush), 54.
 — *Vireo* (White-eyed Vireo), 54.

nuchipennis, *Clinus*, 66.

obscurus, *Puffinus*, 222.
 Oceanic deposits of Swan Island,
 83–89.
ochroptera, *Chrysotis*, 166.
odorata, *Cedrela* “(Cedar” tree), 93.
officinalis, *Guaiacum* (*Guaiacum*
 Tree), 180.
 Orbulina, 87.
 Orchids (*Schomburghia thompsoni-
 ana*), 39, 92.
Ostraconotus, 123, 124.

 PAGE AND ALLEY, 19.
 Palm (*Copernicia*), 91.
Palæmonetes, 125.
Parapagurus, 123.
 Parrots (*Chrysotis ochroptera*), 166.
 — (*Chrysotis rothschildi*), 158,
 160, 166.
perpallida, *Columbigallina* (Cuacao
 Ground Dove), 158, 159, 219.
 Petrels, (*Æstrelata arminjoniana*),
 223.
 — (*Æ. hæsitata*), 221.
 — (*Æ. jamaicensis*), 221.
 — (*Puffinus gravis*), 223,
 224.
 — (*P. obscurus*), 222.
Phyllanthus, 96, 100.
 — *speciosus*, 93.
 Pigeon (*Columba leucocephala*), 40.
piscator, *Sula* (Red-footed Gannet),
 40, 115, 205, 211.
 Plankton, 140.
 Plovers, (*Ægialitis wilsonia*), 51.
 Plums (*Simaruba*), 91.
 — (*Spondias*), 91, 100.
Poliophtila, 162.
polyglottus, *Mimus* (Mocking-bird),
 169.
Polymorphina, 87.
Porites, 59, 60.
Potamonetes, 125.
 Prawn (*Alpheus*), 65.
 — ditch, 125.
 Precambrian rock, 183.
 Pryor, Dr., 155.
Pteroplatea micrura, Embryo of,
 80, 81.
pusillus, *Ereunetes* (Semipalmated
 Sandpiper), 51.
Pylocheles, 122, 124.
Pylopagurus, 122.

Queen-fish (*Acanthocybium solandri*), 70.

Quiscalus, 162.

Radiolaria, 86, 88.

Rail (*Porzana carolina*), 52.

"Rat-Island," 118.

Rats (*Capromys*), 103.

— (*C. metanurus*), 113.

— (*C. thoracatus*), 113.

— (*Myoptamus*), 113.

— Swan Island, 112-115.

Ray, Indian Bat (*Pteroplatea micrura*), Embryo of, 80, 81.

— Evolution of, 81.

Reef formation, 62.

Robinson, Mr. Wirt, 162.

robinsoni, *Butorides* (Robinson's Green Heron), 151, 160.

rostratus, *Mimus gilvus* (Curagao Mocking-bird), 160.

Rotalia, 87.

rothschildi, *Chrysotis* (Rothschild's Parrot), 158, 160, 166, 171.

rubripes eremita, *Mimocichla* (Swan Island Thrush), 40.

rufopileata, *Dendroica* (Curagao yellow Warbler), 158, 160.

rufus fortunatus, *Phylloscopus* (Canary Islands Chiff-chaff), 48.

Ruscus androgynus, 93.

ruticilla, *Setophaga* (Redstart Fly-catcher), 47, 48, 54.

Salicornia, 101.

Sandpipers (*Actitis macularia*), 51.

— (*Ereunetes pusillus*), 51.

Satin-wood Tree (*Xanthoxylon*), 90.

"Savanna Blackbird," 42.

scutillatus, *Remipes* (Mole-Crab), 65.

Sea, Conditions of Life in the deep, 134-137.

— Fans (*Rhipidigorgia flabellum*), 64.

— Grape (*Coccoloba*), 95.

— lavender (*Tournefortia*), 101.

Selachodei, 79.

Sesuvium, 101, 116.

"Seven Brothers," 189, 190.

Shark, Leopard — Contents of stomach of a, 34.

sharpei, *Euethia* (Curagao grass-quit), 161.

Simaruba (Bitter Plum), 91.

Snails (*Drymaeus elongatus*), 168.

Snake-wood (*Brosimum*), 90.

Snapper (*Lutiana*), 73.

solandri, *Acanthocybium*, 70.

speciosus, *Phyllanthus*, 93.

Sphæroidina, 87.

Sphyræna (Barracuda), 59.

— *barracuda*, 72.

Spiders, 91.

Spondias (Hog Plum), 911-00.

Sponges, 28.

Stone, Formation of, 84.

sula, *Sula* (Common Booby), 40, 115, 189, 205, 206.

Suriana, 101.

Swan Island, 3-104, 128-141.

— Birds of, 38-54.

— Botany of, 90-104.

— Buccaneers on, 24-30.

— compared with Barbados, 89

— Fishing at, 69-82.

— History of, 18-20.

— Imaginary Cross-Section N. to S. of, 132.

— Inhabitants of, 9.

— Life on, 12-23.

— Little, 105-127.

— Marine Life of, 55-68.

— Oceanic deposits of, 83-89

— Rat, 112-115.

— Turtles at, 31-37.

— What it is, 128-141.

TARPON, 70.

Teal (*Querquedula discors*), 47.

Terns, Noddy, 189, 190.

— Sooty, 189, 190.

thoracatus, *Capromys* (Swan Island Rat), 113.

Thrashers (*Margarops fuscatus*) 218.

Thrush (*Galeoscoptes carolinensis*), 40.

— (*Mimocichla rubripes eremita*), 40.

— (*Seiurus noveboracensis*), 54.

Ticks, 116

tigrina, *Dendroica*, 47.

tinctoria, *Machura* (Dyewood or Fustic), 90.

Tournefortia, 101.

Townsend, Mr. Charles, 7.

trichas, *Geothlypis* (Maryland yellow-throat), 53.

Trigger-fish (*Balistes*), 67.

Trochus (*Livona pica*), 19.

tuberculata, *Iguana*, 221.

Turtles (*Chelone midas*), 32, 178.

— (*Eretmochelys imbricata*), 32.

Turtles (*Thalassochelys caretta*), 32.

— age of, 35.

— at Swan Island, 31-37.

— breeding season, 33.

— Grass (*zostera marina*), 35.

— infant mortality, 33.

— value of shell, 37.

Tyrant-birds (*Tyrannus domini-censis*), 158, 160.

— (*T. melancholicus*), 165.

uropygialis, *Cæreba*, 164.

varia, *Mniotilta* (Black-and-White Warbler), 52.

vermivorus, *Helmitherus* (Worm-eating Warbler), 52.

violaceus, *Nycticorax* (Night Heron), 151, 159.

Vireo noveboracensis, 54.

virescens, *Butorides* (Little Green Bittern), 40.

vitellina, *Dendroica* (Vitelline Wood-Warbler), 40, 46, 116.

WARBLERS (*Dendroica cærulescens*), 53.

— (*D. coronata*), 40.

— (*D. discolor*), 47.

— (*D. dominica*), 47, 53.

Warblers (*D. rufopileata*), 158, 160

— (*D. tigrina*), 47.

— (*D. vitellina*), 40, 46, 116.

— (*Geothlypis trichas*), 53.

— (*Helmitherus vermivorus*), 52.

— (*Mniotilta varia*), 52.

— (*Parus americana*), 53.

"West Indian Birch" (*Bursera gummifera*), 95, 96.

Western Island, Imaginary Cross-Section N. to S. of, 132.

Whip-ray, 79.

wilsonia, *Ægialitis* (Wilson's Plover) 51.

Wilton, Lady, 70.

Wood-Jones, Mr., 63, 69.

Xanthoxylon (Satin-wood Tree), 90

Xylopagurus, 122.

YELLOW-SHANKS (*Totanus flavipes*), 51.

Zenaida (Doves), 183.

Zenaida Bay, Blanquilla Island, 150.

Zoantharia, 123.

Zoæa, 125.

Zornithoxylon, 90.

Zostera, 64.

Zylophilla, 93.

Three Voyages of a Naturalist. By M. J. NICOLL, M.B.O.U. With an Introduction by The Right Hon. The EARL OF CRAWFORD, K.T., F.R.S. 56 full-page Plates of Life and Scenery. Demy 8vo. Cloth, Gilt Top. 7s. 6d. net.

The Author was Naturalist on the Earl of Crawford's yacht "Valhalla" on three long voyages—round the World, round Africa, to the West Indies. Most of the Islands explored were previously little known, and others had rarely been landed upon.

FIELD:—"Not since the appearance of Moseley's 'Naturalist on the Challenger' have we come across a volume so varied in its contents, so full of curious facts about the animals and plants of remote countries and desert islands."

Through Southern Mexico. By HANS GADOW, M.A., PH.D., F.R.S. Nearly 200 Illustrations. Square Demy 8vo. Over 500 pages. Cloth, Gilt Top. 18s. net.

PALL MALL GAZETTE:—"It is impossible even to mention a hundredth part of the complex thread of interest, whereby he leads us from the City of Mexico, up Mountains, across Swamps and Savannahs, along Rivers and Coastlines, through Forests and Towns. . . . The style is good, making one slip along rapidly."

A Fisherman's Summer in Canada. By F. G. AFLALO. 24 full-page Plates of Life and Scenery. Small Demy 8vo. Cloth. 5s. net.

A brightly written book on Fishing and Touring in the Lower Provinces of Canada. It deals with men and scenery as well as with fishing, and describes a canoe trip of nearly sixty miles down the Miramichi, one of the swiftest salmon rivers of New Brunswick, and the exciting sport of monster Tuna fishing at Cape Breton.

Sunset Playgrounds. By F. G. AFLALO. Impressions of Sport and Scenery, and Men and Cities, gathered during a 20,000 miles trip in California and Canada. With many illustrations. Demy 8vo. Cloth. 7s. 6d. net.

Recent Hunting Trips in British North America. By F. C. SELOUS. With 64 full-page Plates. Popular Edition, 6s. net. Best Edition, Cloth, Gilt Top. 16s. net.

Wanderings among South Sea Savages. By H. WILFRID WALKER, F.R.G.S. 48 full-page Plates from Photographs of Natives and Scenery. Demy 8vo. Cloth, Gilt Top. 7s. 6d. net.

The Author has travelled amongst and sojourned with the wildest tribes of New Guinea, Borneo, Fiji, the Philippines, etc., during the last twenty years. Mr. Walker's experiences have been of the most thrilling nature, and he tells them in that direct and simple manner which carries conviction and enthral the reader.

GLOBE:—"This is that rare thing, a real book of travel."

Across Papua. By Colonel the Hon. KENNETH MACKAY, C.B. 40 full-page Plates of Natives and Scenery. Demy 8vo. Cloth, Gilt Top. 7s. 6d. net.

Recounts in vivid and attractive style his experience as chief of the Royal Commission to British New Guinea.

Through South Westland: A Journey to the Haast and Mount Aspiring, New Zealand. By A. MAUD MORELAND. 48 full-page Plates. Demy 8vo. Cloth. 7s. 6d. net.

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00170788 4

nh QH109.C3L8X

A naturalist on desert islands,